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Chicago, September 18, 1926 (Issued Every Other Week) Volume XXIX, No. 19

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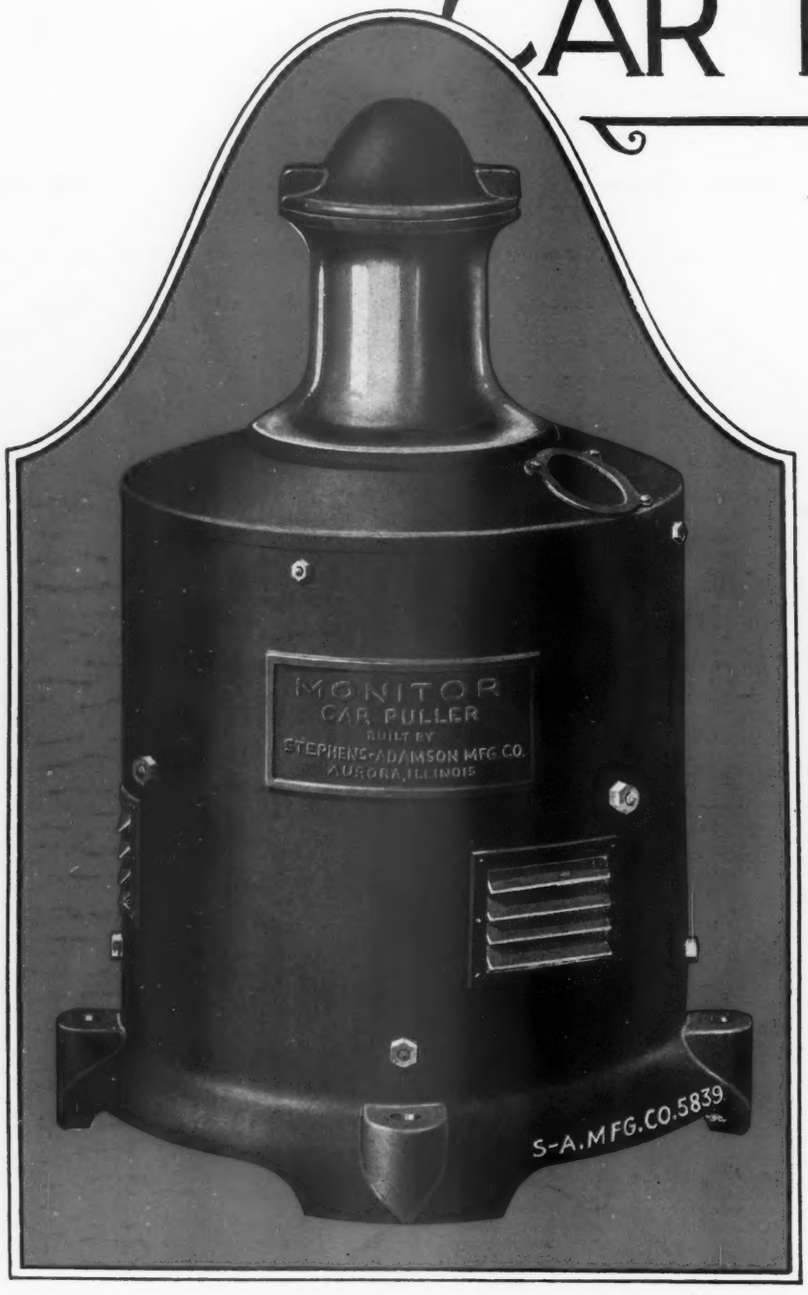

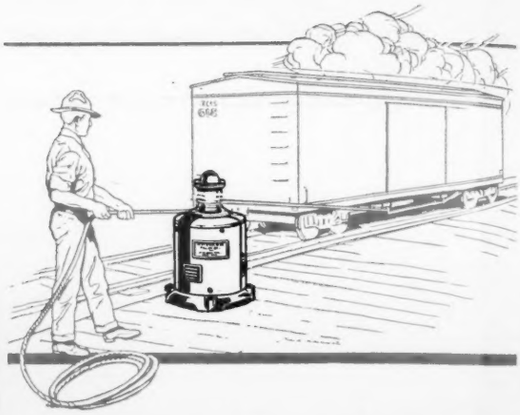

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Rock Products
With Cement and Engineering News Incorporated
Volume XXIX | Chicago, September 18, 1926 | Number 19

Motor Trucks for Quarry Transportation

Motor truck and crawler-tread electric shovel for quarry operation, Dolomite Products Co., Rochester, N. Y.

Motor Trucks for Quarry Transportation

Trucks with Special All-Steel, 12-Ton Capacity Bodies Replace Railway Tracks, Locomotives and Cars at Two General Crushed Stone Company Quarries

By Nathan C. Rockwood
Editor-Manager, Rock Products

AN article in the April 18, 1925, issue of ROCK PRODUCTS described the use of motor trucks for transportation of rock in the quarry of the Dolomite Products Co., near Rochester, N. Y. Smaller trucks had been used at other quarries for handling the rock from the shovel to the crusher, but this was probably the first installation using large size motor trucks (White 5-ton trucks) loaded by a 90-ton steam-shovel to the exclusion of all other methods of quarry transportation. Through the courtesy of John Odenbach, president of the Dolomite Products Co., we were permitted to publish the cost figures for this method of handling stone. These cost figures were $12 per day per truck, including gas, oil, drivers' wages, an ample depreciation allowance—a total of $36 for the three trucks, which were capable of handling 700 to 900 tons a day.

This article, and the cost figures given, aroused much interest in the quarry industry and led to a thorough investigation of the possibility of using motor trucks in place of industrial railways by at least one of the largest quarry operating companies. The result of this investigation was the adoption of motor trucks for quarry transportation in two of the quarries of the General Crushed Stone Co., one at Winchester, Mass., and the other at White Haven, near Wilkes-Barre, Penn.

In an impromptu discussion of motor trucks for quarry transportation, John Rice, president of the General Crushed Stone Co., said at a recent meeting of the New York State Crushed Stone Association (reported in ROCK PRODUCTS, August 7, 1926, p. 80) that the trucks had not been in service long enough to furnish very exact figures of cost, but that for reasonable hauls (around 500 ft.) the estimated cost could be taken at a little less than with railway tracks, locomotives and cars formerly employed at these two quarries—the exact figure being somewhere between 4 and 5 cents per ton. This figure, it will be seen, checks very closely with that given ROCK PRODUCTS by John Odenbach.

Mr. Rice said further that advantages which might not appear at first sight are that the flow of stone to the primary breaker could be better controlled and that large stones could be more easily handled. However, the great advantage in the use of trucks, he said, lies in the extreme mobility of trucks in connection with shovels on caterpillar treads—the trucks can go anywhere in the quarry without waiting for tracks to be shifted and are the logical sequence to the use of caterpillar shovels.

By way of caution Mr. Rice said he was by no means ready to advise every quarry man to adopt trucks for quarry transportation, but he did think under certain conditions the trucks had a decided advantage.

The views herewith show the trucks in operation at both the Winchester and White Haven quarries of the General Crushed Stone Co. The Winchester quarry is in a Boston suburb and is the quarry where some very interesting investigations as to the actual earth tremors from blasting have been carried out in great detail, as reported in previous issues of ROCK PRODUCTS, more especially in the August 22, 1925, issue, in which the personal observations and experiences of the editor are recorded.

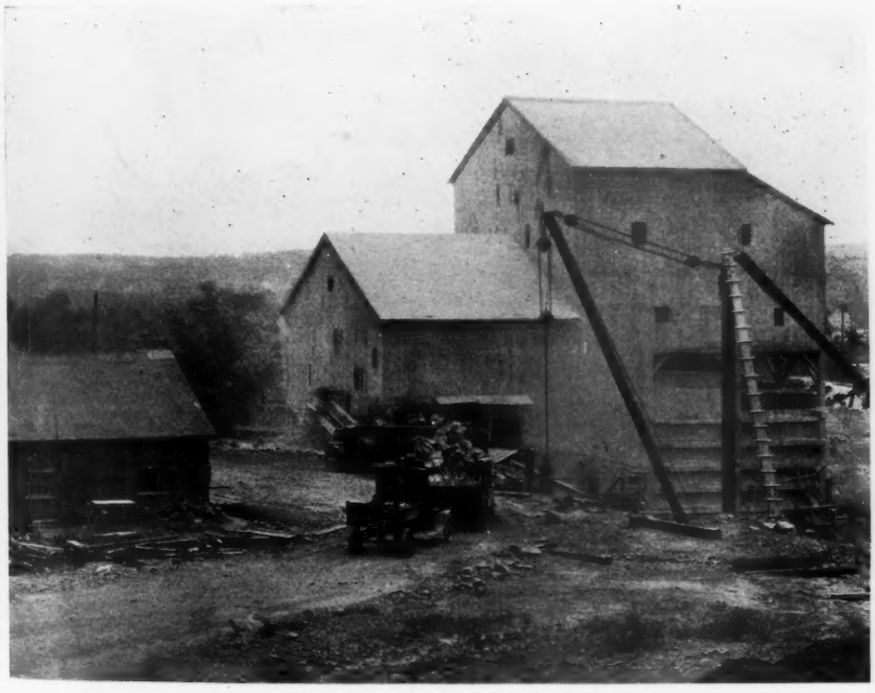
Railway type shovel (90-ton) used for loading trucks at Winchester quarry, and Ford service truck used for cleaning up quarry floor

Blasting Practice at Winchester

It was the editor's good fortune to be present at the quarry on August 6, 1926, when blasting operations were again in progress. This time he went back on the hill, whence come most of the complaints, to personally experience the "California earthquakes" which have caused much local agitation and publicity. Most of the houses are a half-mile from the quarry and, as was to be expected, the concussions from the blasting, while clearly perceptible, were not such as to cause women to go into hysterics, or babies to wake up from their naps, as has been claimed by some of the residents.

Of course, it is easy to see and understand that the blasting is regarded as annoying. The operation of any industrial plant is almost invariably annoying to nearby residents, but as one lady remarked: "We have to put up with numerous annoyances in life." Evidently the company has as many, or more, friends as it has hecklers, but the hecklers are causing some of the company executives a great deal of anxiety because the company officials are really doing their level best to operate the quarry with the least possible annoyance to their neighbors.

Caterpillar equipped railway type shovel loading truck at Winchester quarry



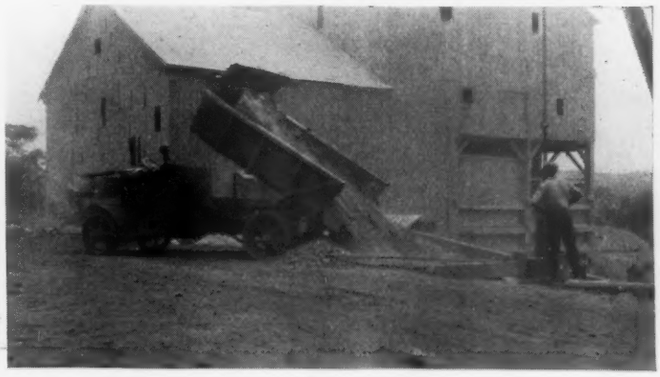
Winchester plant of the General Crushed Stone Co.—Derrick serves the primary crusher

Charges of explosives are confined to 1500 or 1600 lb., distributed in three holes. Occasionally 12 holes are made ready at a time, and then are fired, three together, at intervals of about 10 minutes. The quarry face is between 800 and 900 ft. long, about 140 ft. high in the center, and slopes off to the quarry floor level at both ends. Well drills are used. The nearest houses are at least 1500 ft. from the quarry, but are on a hill which is probably underlaid with the same rock formation. Scientific investigation has proved, however, that the earth tremor is negligible; it is the concussion in the atmosphere that residents feel and object to.

This method of blasting is not an economical one from a quarry operating standpoint, because two-thirds of the holes are end holes and inevitably result in the loosening of huge blocks of stone which must subsequently be block-holed. It would appear that no objection has ever been made to this secondary blasting.

General Conditions at Winchester

The natural quarry floor at Winchester is quite smooth. The elevation of the quarry floor above the main crushing plant is such that the trucks dump into the primary breaker (a 42x48-in. Traylor jaw crusher)



Truck at dumping hopper, Winchester quarry, backing up from a position parallel to driveway

on the quarry-floor level. The location of the primary crusher is such that the trucks run by the crusher opening and then back up. Until a side-dump motor truck is perfected there apparently is no way to avoid backing up.

Trucks with Special All-Steel Bodies

The shovels used in this quarry are 90-ton Marion railway type shovels with 3-yd. buckets. One of the shovels is on railway trucks, the other has been converted to caterpillar traction. The trucks are 7½-ton Macks with special 12-ton steel bodies, designed and built by the Easton Car and Construction Co., Easton, Penn. The bodies have a special tail gate operating on the same principle as the quarry car doors designed and patented by John Rice, Jr., and first used on the "Won Way" (one way) cars made by the Easton Car and Construction Co. The trucks actually carry an average of about 11 tons to a load.

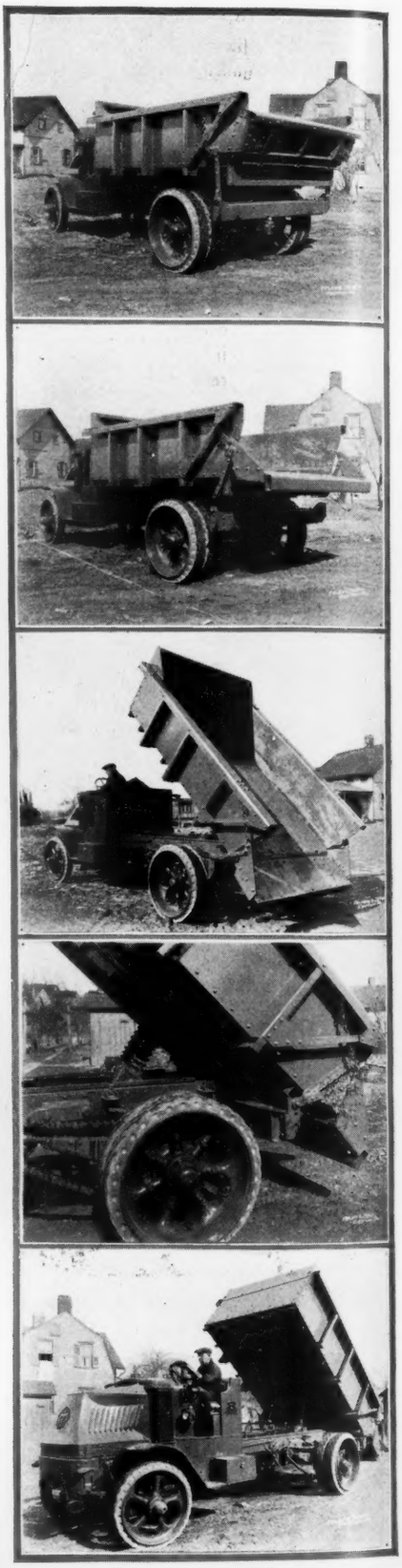
Three trucks replaced an industrial railway (3-ft. gage) operated with three steam locomotives and 30 cars (4-yd. side-dump). There was about 1800 ft. of track to maintain. Trains were operated of six cars each, with about 6 tons to a car. This method, with other considerations, gave the plant a capacity of about 1400 tons daily.

The introduction of motor trucks eliminated the work of six men engaged in maintenance of track and miscellaneous

Results of a series of blasts at Winchester quarry

Three of the trucks at the Winchester quarry

Trucks at the White Haven quarry of the General Crushed Stone Co.



Details of the special truck body, Winchester and White Haven plants, General Crushed Stone Co.

work about the quarry, and one truck driver replaces a train crew of two men. Two men and a Ford truck replace a crew of about six men formerly at work cleaning up the quarry.

Cost Data on Truck Operation

The trucks use an average of about 14 gal. of gasoline per day each. They might average about 300 loads a day for the three trucks, or something over 3300 tons. The production of the quarry is now limited by the plant rather than the transportation system. The average truck haul is something between 500 and 600 ft.

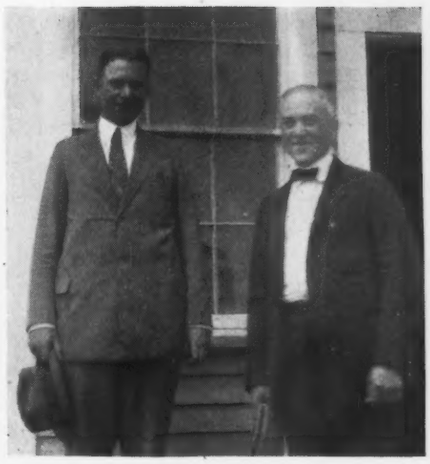
The investment in trucks at the Winchester quarry is placed at about the same figure as in the older railway system and equipment, taking into account the depreciated value of the railway equipment. The trucks cost less than new railway equipment to replace the old would have cost.

At the White Haven quarry, near Wilkes-Barre, Penn., it is understood that the use of trucks has not been so satisfactory, which is attributed partly to less favorable conditions for truck operation and to the use of smaller shovels (1¼-yd.). Contrary to ordinary expectation, the larger and heavier shovels seem to prove the most efficient for truck loading.

New Crusher at Winchester

Incidentally, it will interest the quarry industry to know that the General Crushed Stone Co. has been experimenting at the Winchester plant with a new Symons reduction crusher. This is a high-speed gyratory crusher with pressure lubrication. For correct functioning the crusher must not be crowded, and to prevent crowding an automatic feed is provided. This is a flat-conical plate attached to the top of the center shaft, which revolves rapidly and throws the stone, which is delivered to the center of the plate, to the outside of the crusher opening all the way around.

Another visitor at the time of the editor's call was W. L. Sporborg, president of the Rock-Cut Stone Co., Syracuse, N. Y., who expressed much interest in the performance of the new crusher.



O. M. Graves, vice-president and general manager, General Crushed Stone Co., and W. L. Sporborg, his guest for a day

The new crusher is placed as near to the quarry floor as practicable. It will discharge to a 42-in. belt conveyor which will extend back into the quarry and feed an inclined belt conveyor to a 300-ton bin. This bin will serve as a feed bin for the present primary breaker, through bottom discharge gates, feeder, and a belt conveyor. It is planned eventually to remove finished sizes of stone at this point and store them in bins on the quarry floor, which will be made easily accessible to delivery trucks. In this manner the old plant will become merely a reduction unit.

John Odenbach's quarry trucks have bodies designed and built by him at the company's garage and shop. They have a tail-board which straightens out even with the floor of the body, when the truck is in dumping position. Instead of a lever or crank connection between the tail-board and the truck chassis, as in the Winchester trucks, the tail-board of these trucks is raised and lowered by a wire-rope connection through a pulley, as shown in one of the views herewith.

The truck bodies are particularly interest-

New high-speed reduction crusher recently installed at Winchester plant

Truck dumping into primary crusher at White Haven plant

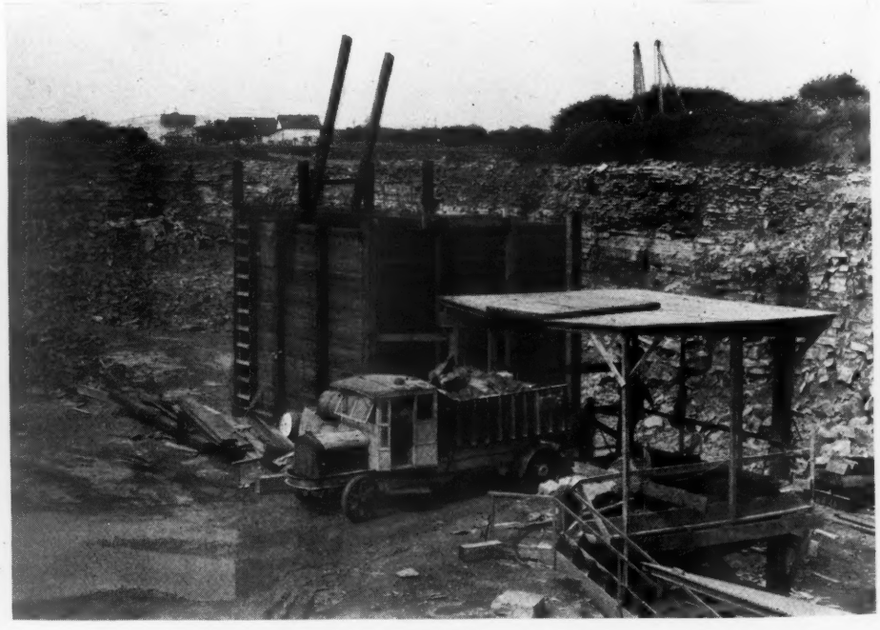
Dolomite Products Co. Operation

Some recent views of the quarry operation of the Dolomite Products Co., near Rochester, N. Y., are included herewith. At this quarry four 5-ton White trucks (one of the trucks is a spare) handle all the material between the new Model 37 Marion electric shovel and the primary crusher, which has been moved down into the quarry since our article of April 18, 1925. This shovel is particularly interesting because it operates on a 220-v. incoming current. The reason for this is that Mr. Odenbach wanted the operation 100% safe. The 220-v. current requires a larger and consequently more expensive cable, but a fatal accident from contact with the cable is eliminated. A new 42-in. McCully gyratory crusher is being installed ahead of the present No. 8 Kennedy.

Plankways laid on stone stock pile—trucks used for stocking stone when occasion demands

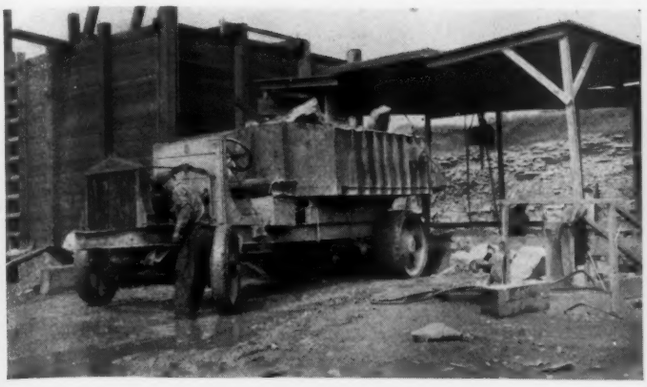
View of the plant end of the Dolomite Products Co. quarry, near Rochester, N. Y.

Installing a 42-in. gyratory crusher



Dolomite Products Co. quarry near Rochester, N. Y.

Installing a 42-in. gyatory crusher in the quarry of the Dolomite Products Co., Rochester, N. Y.



Truck dumping into present primary crusher, Dolomite Products Co. quarry

ing since they are electrically welded throughout, no rivets being used except where the dumping mechanism is attached to the truck chassis. The truck chasses themselves have been in constant use in the quarry for several years.

Besides the four White trucks used in the quarry the Dolomite Products Co. has a fleet of 18 Mack trucks (7½-ton) for delivery service. A new garage, fireproof, built of concrete block with steel roof trusses, has recently been completed, and at the time of the editor's visit a site was being prepared for an office building and company club house.

Part of the fleet of 18 delivery trucks of the Dolomite Products Co.

New East African Cement Plant*

THE works of the Mozambique Portland Cement Co., Ltd., Lourenco Marques, Portuguese East Africa, are situated at Port Matolla and were designed to produce 35,000 tons of portland cement per annum by the "wet" process, with provision for duplication. The raw materials are hard limestone and river mud. The former is quarried at a distance of about 90 km. and is brought to the works by rail, and the latter is excavated from the swamp fringing the Espirito Santo estuary, upon which the factory is built. The limestone is fed on to an inclined rubber belt conveyor and raised to the crushing plant. This consists of a jaw crusher fed by "grizzly" bars under which is a single roller mill. The fine stone falls through the bars directly to the rolls, while the large stone first passes through the crusher. The stone, which has been reduced to walnut size and less, is elevated into a reinforced concrete hopper over the grinding mill.

Methods of Working

The clay is treated in a wash mill, and the resulting slurry is pumped by pneumatic pressers to a second r.c. hopper over the grinding mill adjacent to the limestone hopper. The crushed limestone and clay slurry are introduced together with water into a compound ball-and-tube mill having an output of about 12 tons of raw material per hour ground to a fineness of 5% on 180-mesh sieve. The slurry produced contains about 38% of water, and is pumped by pressors into one of three r.c. slurry tanks. The slurry is mixed and agitated by means of 13 compressed air tubes to each tank.

The slurry drawn from the tanks is led to a sump where the level is kept constant by a regulating valve. Thence it is pumped pneumatically to the kiln feed tank, in which the level is kept constant by pumping rather more than is required and allowing the surplus to return.

The kiln gases discharge into a dust chamber with hoppers in the bottom. The dust is reclaimed by a worm conveyor and elevated to the kiln feed pipe, by which means it is reintroduced into the kiln.

The rotary kiln is of the combined kiln and cooler type, the overall length being 184 ft., of which 13 ft. at the lower end forms the cooler. The diameter is 2.3 m., and 2.8 m. in the firing zone. The kiln is lined with refractory firebricks, and runs upon four cast steel tires bearing on steel rollers in adjustable bearings. The two speeds are 0.62 and 0.845 r.p.m., and the changes are made from the burning-platform.

The coal for firing is first treated in a dryer, and it is ground in a compound ball-and-tube mill to a fineness of 10% on 180-mesh sieve. The coal dust is either stored in a concrete hopper or fed direct to the steel bin over the coal-feed fan to the kiln.

Clinker Treatment

The clinker from the kiln is taken by a shaker conveyor to an elevator which lifts it onto a series of three shaker conveyors in all 81 m. long, which distribute it over the store. The clinker is reclaimed from the store by means of a similar series of shaker conveyors running in a tunnel underneath, which takes it to the elevator feeding a hopper over the cement mill. Gypsum is added to the clinker before it is elevated.

The cement mill is of the compound ball-and-tube type. Steel balls and flint pebbles are used, the total weight of the charge being about 18 tons. Power consumption is about 215 hp., when grinding 5 to 6 tons of cement per hour to a fineness of 7% to 8% on 180-mesh sieve. The motor is direct coupled, and the mill and conveyors are fitted with dust-extraction plant.

Two identical horizontal single-acting air compressors are each driven by a 75-hp. motor. Three methods are used to supply air for the pressors and agitation. One compressor may work alone on full load, charging the high pressure receiver from which the pressors are fed. Any air not needed for this purpose is discharged into the low pressure receiver and used for agitation. Both compressors may work at the same time, one filling the high pressure receiver and the other the low. Finally, the compressors may work as indicated in the second method, but the over-production of air in the high pressure receiver can be led through a blow-off valve into the low pressure receiver. Only in exceptional cases will this be required, and the compressors will then be absorbing about 100-105 hp. The total power required on the works is about 814 hp.

*Abstract of a paper by Henry Pooley, A. M. Inst. C. E., communicated to the Institution of Civil Engineers (Great Britain).

Plant of Central Sand and Gravel Co. at Memphis, Tenn., where material is cleaned by jigging

Cleaning Gravel by Jigging

Details of Method Employed at Plant of Central Sand and Gravel Co., Memphis, Tenn.

IN the early part of 1924 Rock Products published an account of the building of the Central Sand and Gravel Co.'s plant, at Memphis, Tenn., in which jigs were being installed to clean the gravel from lignite, trash and mudballs. In the Annual Review number for 1924 it gave a brief description of the work of the plant. It was evident that the publication of these articles caused considerable interest in the sand and gravel industry, for a number of inquiries have since been received, and the editors have been asked personally by several producers as to the success of the installation.

Its success was important to the industry because, while gravels containing lignite are comparatively rare, there are many gravels which contain trash and mudballs, which may be removed by the same method. And in the past year the Link-Belt Co. has applied the jig to the removal of shale from gravel with considerable success. Shale is, unfortunately, quite often found in gravels, and any method which will remove it will add entensively to the sand and gravel resources of the country.

Regarding the work at Memphis, there are three questions which have been asked: Is it commercially successful; does it really make clean gravel, and is it expensive? All three must be answered in the affirmative. The plant is successful commercially, selling its product at a fair margin above cost of production. It certainly does make clean gravel, cleaner than the writer has seen made by any other washing process. If the removal of the lignite, trash and mudballs is not 100% it must be very close to it, for none of the bins or carloads that were inspected showed any of these deleterious materials. But it must also be admitted that, as compared with some other processes, the expense is fairly high. The capacity of the single jig working when the plant was visited was given at 60 to 80 tons per hour. To clean this gravel required the water pumped by a 10-in. centrifugal pump connected to a 75 h.p. motor, the power of a 50 h.p. motor to run the jig and the labor of four well-paid men. So, while both the commercial and technical success of the plant is unquestioned, the cost feature has encouraged the operating company to try out other machines to see if the same result could not be obtained with less labor and power.

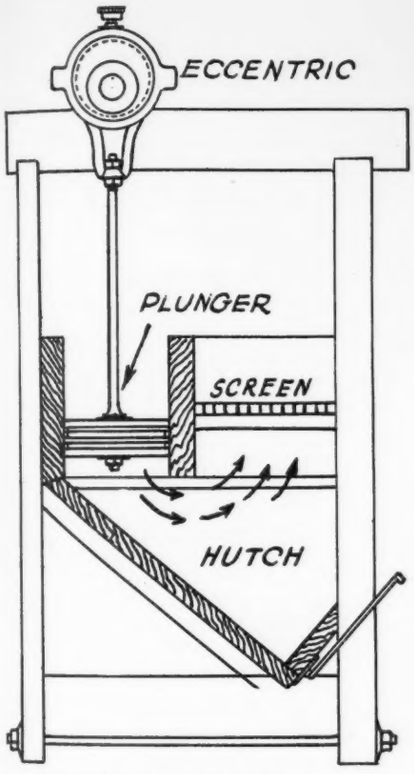
To understand the method the entire operation should be briefly reviewed, and as photographs show nothing of what goes on inside the jig a rough sketch has been drawn from which to explain its action.

The gravel comes from the Mississippi river and is pumped at varying distances from the plant, according to the stage of the river. A 15-in. dredge pump is used. The

Larger lumps of mud, coal and trash are picked from belt

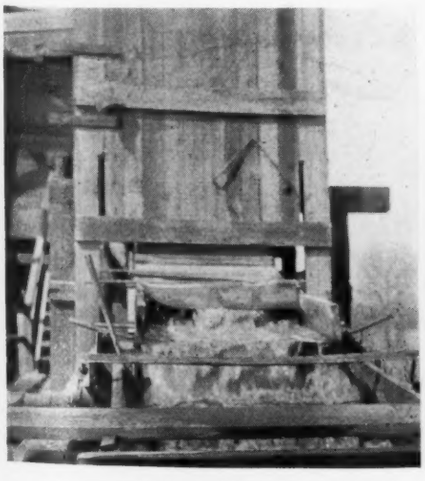
Belt takes undersize of scalping screen to jig feed bins

gravel and sand are pumped on steel barges holding 1150 tons, which draw 10 ft. of water when loaded. They are of the flush deck, cargo box type and are unloaded at the plant by an American Hoist and Derrick Co.'s stiff-leg derrick with a 2½-yd. Hayward bucket. The hoist which handles this is run by steam from an upright boiler. It was made by the American Hoist and Derrick Co. and has 10x12-in. cylinders and three drums. There is a small independent engine for turning the "bull-wheel."



Illustrating the principal of the jig

Although the gravel has been washed to the extent that pumping on a barge and allowing the excess water to overflow will wash it, it is too dirty to be salable. The pebbles are covered with films of mud and there are occasional lumps of mud or clay



Water carrying mud and lignite from jigs

Men working at the jig gates

and some trash and coal. Much of this is picked off by two laborers as it passes to the plant on a conveyor belt of 450 ft. centers. Of course, only the larger pieces that can be easily seen are removed in this way, leaving the smaller pieces to be dealt with by the plant equipment.

The conveyor discharges into a 12-ft. scalping screen with 1¾-in. perforations. The oversize goes to a Kennedy crusher and the undersize to bins from which it is afterward sent to the jig. The oversize, after crushing, is elevated to a screen of the same size and type as the scalping screen. The undersize of this screen is sent to bins and the oversize is returned to the crusher.

The undersize of the scalping screen is distributed to the bins beneath by a 24-in. conveyor and tripper. There are three or four bins used for this material, all of which are arranged to feed to another belt conveyor that takes the material to the jig house. The bins nearest the jig can feed to the jig by gravity and this was the method being used when the plant was visited. When no barge is being unloaded and the gravity feed bins are low the other bins and the conveyor are called upon.

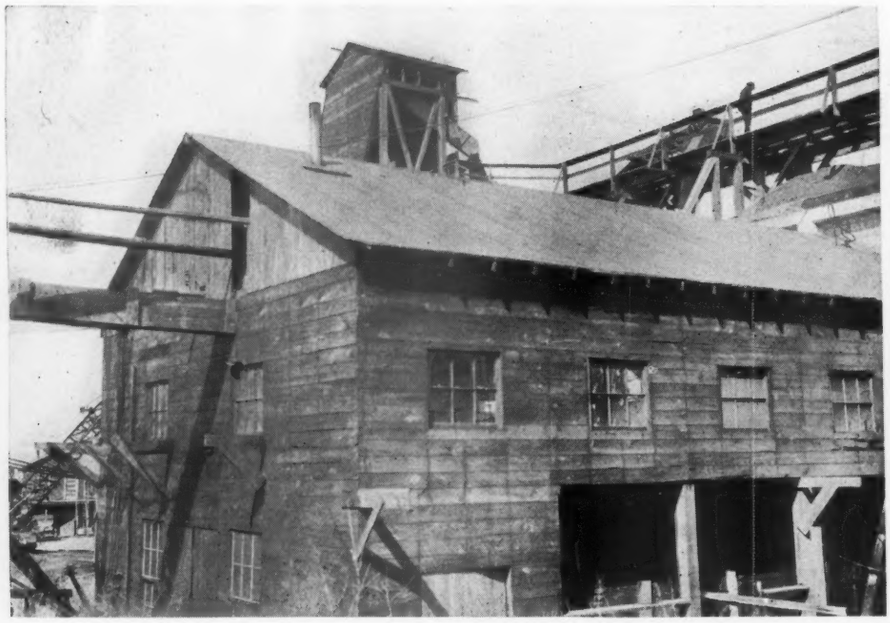
The feed to the jig runs through an adjustable gate and the amount which is fed has to be carefully regulated. If the feed was a uniform mixture of sand and gravel this would not be necessary, but as the proportion between the two varies the amount fed has to be varied accordingly. The sand is largely drawn out in the first cells at the beginning of jigging, leaving mostly gravel in the jig bed. Hence, if the gravel runs high in the feed, the feed must be cut back to avoid overloading the jig.

The type of jig used is not new, as it has been used in the concentration of ores and in coal washing for many years. The reader who desires a more detailed description of this and other forms of jigs is referred to any of the standard works on coal washing and ore concentration. "Ore Dressing," by Prof. Robert H. Richards, is one that may be found in many public libraries.

The jigs are alike except that one is right hand while the other is left hand. Each is about 33 ft. long and is divided by partitions so that there are seven compartments or cells in each. Each cell is set about 6 in. lower than the one before it, which causes a flow from one to the other. Except for this difference in height, one cell is like any of the others. Seven one-cell jigs placed to feed one into the other would do the same work. Hence the description and diagram will refer to only a single cell and describe what goes on in it.

There is a longitudinal partition through all the cells dividing them into two compartments, as shown in the sketch. In one of these is the jig plunger and in the other is the screen with its bed of gravel and lignite. Each compartment is 42x48 in.

Hoist operator sits in glass cabin

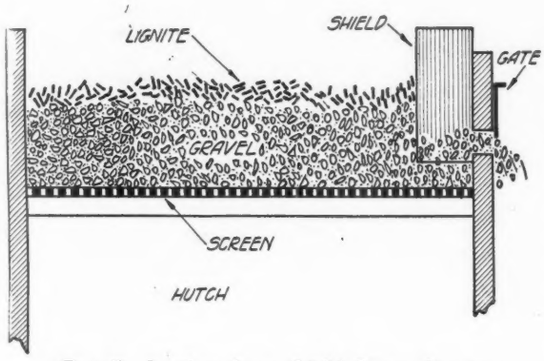


This building houses the two jigs

The plunger is moved up and down in the water compartment by a rod which is fastened to an eccentric on a shaft above. By having a double eccentric the amount of up and down motion or "throw" may be regulated. By changing the speed of the shaft the number of pulsations may be regulated. On the day the plant was visited the shaft was making 95 r.p.m. and the length of stroke was judged to be about 2 in.

Both the up and down strokes play their part in jigging. The down stroke of the plunger produces what is technically called pulsion and the up-stroke produces suction. The effect of pulsion is to lift the gravel in the bed and spread the pebbles apart. Pulsion is, in fact, a strong momentary current rising through the screen, and the effect is the same as any current on a mass of grains; it separates and agitates them. The lignite and the trash and the mudballs are all lighter than the pebbles of the gravel and hence they are pushed farther up by pulsion. In this way they work themselves to the top so that the material stratifies with the lignite on top and the gravel below it.

Suction, which is formed on the return stroke of the plunger, has the opposite effect of pulsion, that is, it pulls the pebbles down on the screen and brings them together. But as the pebbles are nearer the screen and heavier, they go down to the screen more quickly than the lignite and trash and hence leave these substances above them. Both pulsion and suction thus have the effect of stratifying the material.



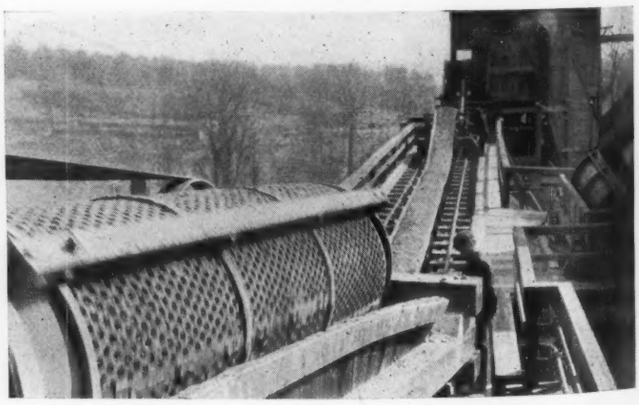
Detail showing how shield keeps lignite from going out with gravel

But as sand is present suction has another function, that of pulling the sand through the gravel and through the screen down into the space below, which is called the "hutch." A little fine lignite will sometimes accompany the sand into the hutch but not enough to do any harm. However, the gravel is thoroughly cleaned.

This is a continuous process, so the material must be removed as fast as it is fed. The water which is fed into the jig flows from one compartment to another, taking the lignite with it and, except in the case of the last compartment, some gravel. Gravel is discharged from each cell through an opening that is shielded from the lignite by a half cylinder of sheet metal. The gravel comes into this cylinder from below and flows out through an opening that has a sliding gate. On the first cells of the jig these gates may be adjusted and left alone, but the gates on the last two cells need almost continual adjusting. If they are not constantly watched the gravel either will draw down until lignite is drawn out with it, or else gravel will accumulate until it goes over with the lignite into the waste. The discharge of sand from the hutches has also to be watched. If it accumulates in the hutch it will interfere with the pulsation of the water as the plunger moves up and down. If it is drawn off too fast it will cause a current that will weaken the effect of the plunger.

This is where the labor comes in. The men who watch these things have to be reliable and conscientious about their work. In addition they have to understand the process and know when everything is working right. And twice a day the screens have to be cleaned, during the noon hour and at night. Naturally no ordinary laborer can be trusted to do these things.

The sand and gravel each discharge into launders and flow into the boots of elevators which are 86 ft. high, center to center. These are of the regular wet elevator type, with the buckets spaced wider than for dry work and the belt running fast enough to discharge the buckets by



Screens and conveyors at top of plant

centrifugal force. The gravel goes to a sizing screen with ⅜-in. and 1¼-in. holes. This makes three products, each of which goes to a bin.

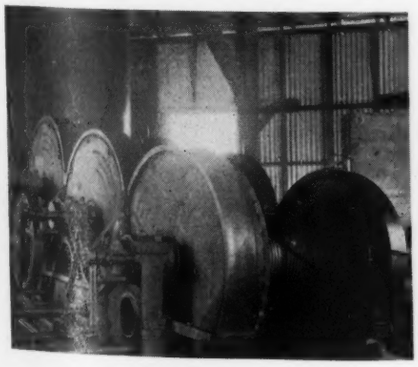
The discharge from the hutches has been spoken of as sand for the sake of simplicity, but it is everything that passes the ½-in. slot

Crusher takes oversize of scalping screen

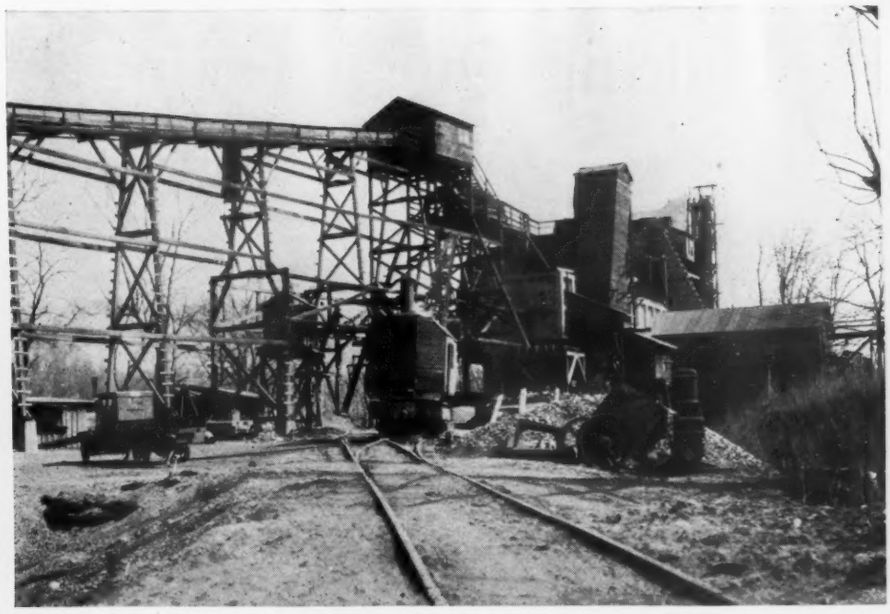
screen in the jig and hence is really a mixture of sand and pea gravel. This is passed over a bar screen or grizzly 14 ft. long and 4 ft. wide. The bars are set 5/16 in. apart and the undersize is sand and the oversize is pea gravel. The sand goes to a bin but the pea gravel goes over an Austin shaking screen for further cleaning.

The splendid construction of this plant with its concrete bins has many times been noted in engineering and technical papers, including Rock Products, for June 14 and December 27, 1924, so it will not be dwelt upon here. Except as otherwise noted, the machinery was furnished by Stephens-Adamson and the motors are of Westinghouse make.

Successful as this plant is, the owners do



Hoist of stiff-leg derrick used to unload barges



Central Sand and Gravel Co. plant, Memphis, Tenn.

not believe it is the last word in cleaning gravel and they are trying other machines. At their Greenville, Miss., plant they have installed an Eagle washer, made in Des Moines, Iowa. The original machine apparently did not hold the gravel long enough to get out all the lignite, so it was lengthened from 12 ft. to 18 ft. Since lengthening it has been turning out very clean gravel, but the testing period was not thought long enough to be conclusive. The "Perfect" classifier made in Nashville, Tenn., is also being considered and its work at other plants is being noted. These machines could not make any cleaner gravel than the jig does, but they would clean it with less power and attention.

However, the writer does not believe that the final word in jigging gravel has yet been said. There are many other forms of jig beside the simple plunger jig that is used here. And there are possibilities of handling it in other ways. One which readily suggests itself is the removal of the sand so that only the gravel is jigged. This has been done in jigging ore with the purpose of giving the jig a more uniform feed and it has been successful in that respect. The removal of the lignite from the sand might then be accomplished in a machine of a different type.

The advantage to the industry of having jigging tried out on so large a scale cannot be overestimated and the industry is indebted to the Central Sand and Gravel Co. for being so ready to make the plant details and the results public. Even though the jig may be superseded by other machines for the removal of lignite at this particular plant, the data gained will be invaluable in applying the jig to the more serious matter of treating shaley gravels. This is a problem that is coming up in the near future, especially in some northwestern states where gravel is commonly contaminated by shale and where it is badly needed as concrete road

Superintendent Peterson, in charge of plant

material. At present the jig is the only machine that has shown any success in removing shale.

The Central Sand and Gravel Co. is a subsidiary of the Fischer Lime and Cement Co. of Memphis, Tenn. Its offices are at 269 Walnut street. W. W. Fisher is president of the company and L. T. McCourt has charge of the sand and gravel department. J. M. Peterson is plant superintendent.

Thickened Street Paving

TWO movements in progress at the present time will add to the market for cement and aggregate. One is to make broader highways, the other is to thicken street concrete paving, and the base for asphalt paving, in order to sustain the constantly increasing weight of traffic. As an example, Indianapolis, Ind., has just put out new specifications raising the thickness of concrete paving from 8-in. to 9-in. and calling for a heavier base for asphalt paving.

Making Quick-Setting Lime Plaster

Kraus Research Laboratories of New York City Has Demonstration Plant at Cockeysville, Md.

IN ROCK PRODUCTS for Sept. 5, 1925, was published a description of the quick-setting lime plaster which had been developed by the Kraus Research Laboratories, New York City. At that time the process was only in the laboratory stage. It has since been developed to the manufacturing stage and a plant for producing it on a small scale has been built and is now in operation at Cockeysville, Md. The tonnage produced is small and has mainly been disposed of by being sent to plaster contractors in various parts of the country for them to try out in order that they might become acquainted with the product.

This little plant was erected principally to serve as a "pilot plant" for a full-sized production works which is shortly to be erected. So, while the output is small, the manufacturing is carried on exactly as it would be in a large plant to get such data as the size of various units which are to be built, the length of time required for the different stages, and a satisfactory flow-sheet which will send the raw material through to the finished product bin in the shortest and simplest way.

Kraus plaster (it has never received a formal name) is a mixture of roasted and acid-treated clay, raw clay, ground limestone and burned lime which becomes hydrated during the mixing process. It sets about as quickly as a gypsum plaster and still it has the sand-carrying and acoustic properties of lime plaster. It goes to the consumer in paper bags and requires only to be mixed with water to be ready for the wall. Both brown coat and finish plasters may be made, but so far the work has been largely confined to making a good brown coat and scratch coat material.

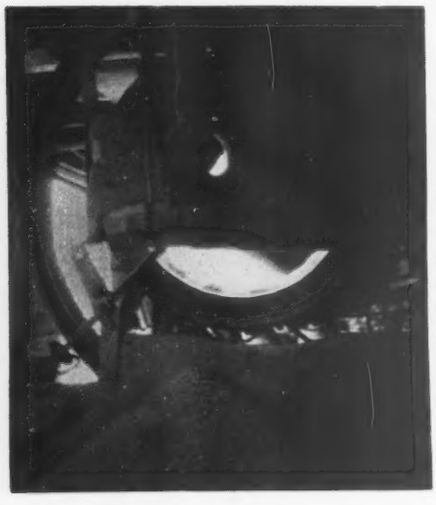
Charles Kraus, head of Kraus Research Laboratories

Two Kinds of Clay Used to Mix With Lime

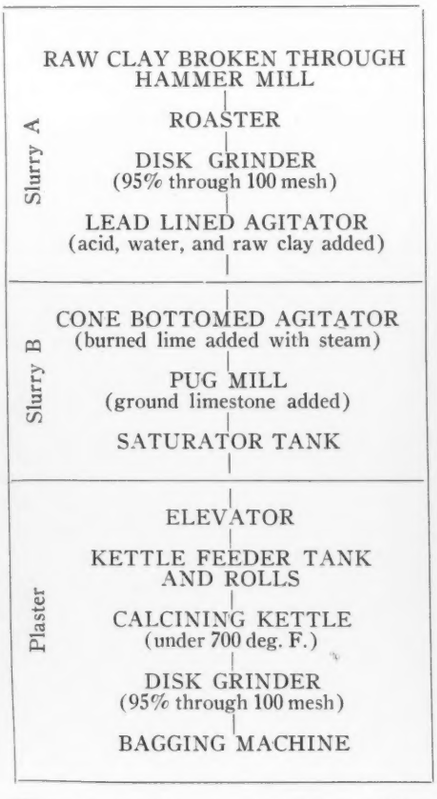
The process starts with the roasting of the clay. Almost any clay will do for this, but at the demonstration plant a part of the clay used is Georgia ball clay and a part is strippings from the quarry of a local producer of lime and limestone. The raw clay is first passed through a hammer mill, made locally to the company's own design, although any hammer mill could be used. This clay is then fed to a roaster which is like a small cement kiln, 30 in. in diameter and 8 ft. long. Oil is used for fuel and the temperature varies according to the type of clay used. A pyrometer is used to record this temperature, as every part of the process needs recording in this partially experimental work.

After passing the roaster the clay falls on the ground and is allowed to cool sufficiently to be handled. It is then taken by a wheelbarrow and elevated to the hopper of a small Sturtevant mill, where it is ground so that 95% will pass 100 mesh. If there are any pieces of limestone in the clay these are broken up in the hammer mill and ground in the Sturtevant mill sufficiently so as not to interfere with the process. Ground limestone is added anyway at a later stage.

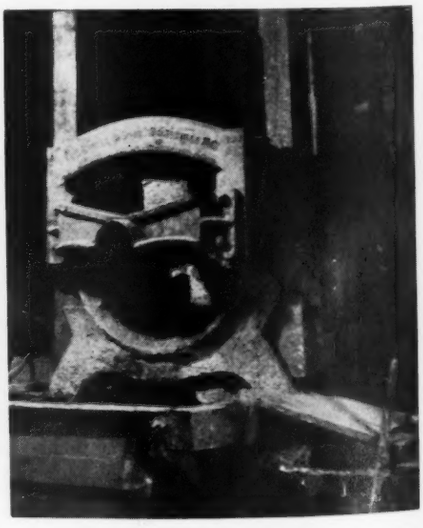
The ground roasted clay is elevated to a lead-lined agitator in which the acid treatment is given. This is about 6 ft. in diameter and 4 ft. deep, and is made of sheet steel lined with sheet lead joined by burn-



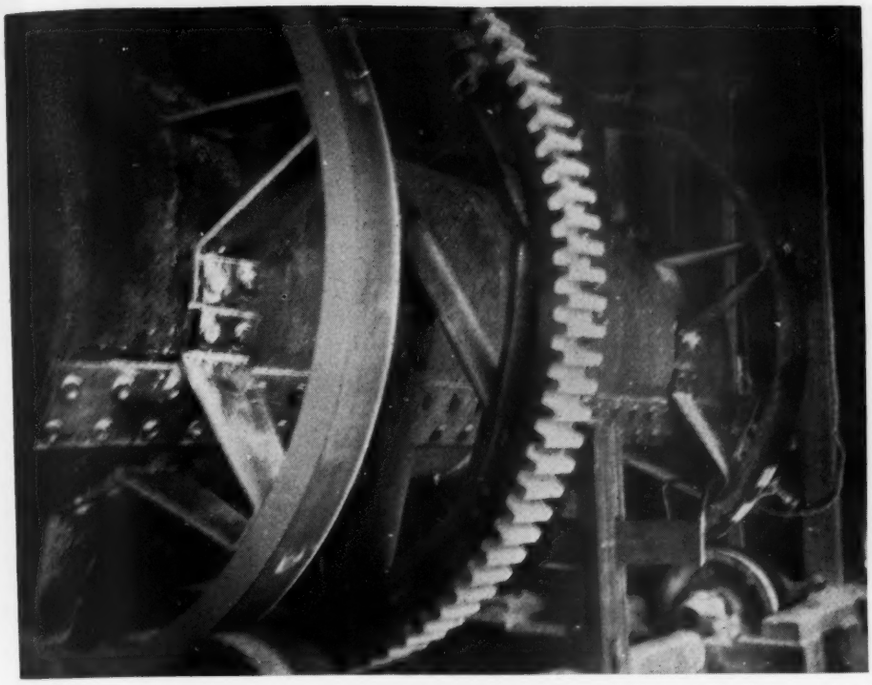
Discharge from clay roaster



Flow Sheet of Kraus Lime Plaster Plant



End of pug mill



Clay is roasted in a cylinder like a short cement kiln

ing. So far this tank shows no signs of deterioration. It is fitted with a turbine agitator, a flat disk with curved blades which draws in the contents of the tank at the center and expels it on the outside. This type of agitator not only insures thorough mixing, but the current set up by it prevents material from settling on the bottom of the tank. Treatment goes on for 2½ hr. After 1½ hr. some raw clay is added with more water to thin down the mixture to about the consistency of milk.

This part of the process is called "making slurry A." In a large plant it is expected that slurry A will be mixed in large batches and used as desired. It does not deteriorate, and agitating for long periods of time is rather beneficial than otherwise.

The next stage of the process is called "making slurry B," which is a mixture of slurry A, lime and limestone. A measured amount of slurry A is let down into a steel plate cone-bottomed agitator. No lead lining is needed for this, as the acid is all combined in making slurry A. Burned lime in lump form which has been broken to pass a ¾-in. mesh is added here as rapidly as possible.

Louis P. Kraus

A brisk chemical action is set up in this tank, due to the combining of the lime with the acid-treated clay. This raises the temperature to 300 deg. F. in warm weather, the temperature being recorded by a pyrometer. In cold weather steam may be used to bring the temperature to this figure. The mass is digested for 20 min. and during this period it is cut and turned by two blade agitators working on a central shaft in the tank. At the end of 20 min. it has the consistency of soft mud, that is, it will flow somewhat but not easily.

It runs from the cone-bottomed agitator to an 8-ft. pug mill set below the floor. This is a trough in which a shaft fitted with blades revolves. The blades cut and turn the material at the same time that they urge it forward. There is a hole in the floor above the pug mill and a workman adds ground limestone through this hole. He judges how much to add by the consistency of the pulp. It thickens up as the ground limestone is added.

From the pug mill the mass (now called "slurry B") goes by a short screw conveyor to the "saturator." This is a simple concrete square tank in which slurry B remains for at least 24 hr. A longer time is considered better. During this period the chemical action which was started in the agitator is completed. Heat is developed and this serves to dry out the material. After 24 hr. the material is in lumps dry all the way through. These lumps may be crushed quite easily and may be broken with the fingers.

In a full-sized plant the saturator tanks could be utilized as storage in order to equalize the flow of material through the plant.

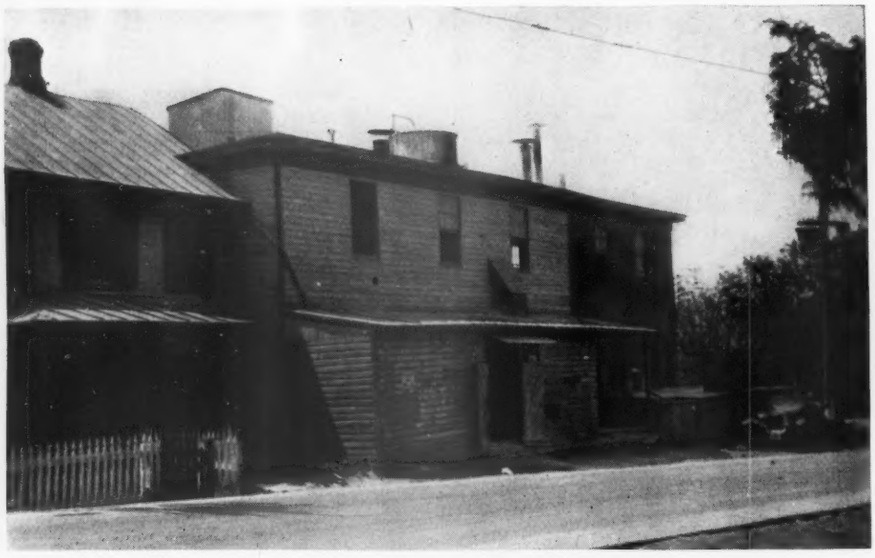
From the saturator the lumpy material is shoveled to the boot of a bucket and belt elevator. This raises it to the kettle feeder tank in which there is a set of rolls driven through gearing on top of the tank. These rolls crush the lumps sufficiently so that the material may be calcined in an ordinary gypsum kettle. This feeder tank holds the charge until the kettle is ready.

Calcination Takes Place in Gypsum Kettle

The kettle is an ordinary 4-ft. gypsum kettle of Ehrsam make, fired with oil. Calcining goes on for 2 hr., the temperature being always less than 700 deg. F. The kettle is discharged into steel drums which serve as hot pits, and it is later taken to the Sturtevant mill and ground and sacked. The grinding is again so that 95% will pass a 100-mesh screen. Hair may be added as the product is bagged, provided this is required.

The plant is admittedly "out of balance"; that is, the grinding mill is too small or the other units are too large, as you wish to

Calciner feed tank which contains rolls for breaking lumps



Demonstration plant for making new quick setting lime plaster

put it. Other parts of the plant have been deliberately planned out of proportion to get certain data for design. But the process goes on smoothly enough and the plaster is of even better quality than was expected from laboratory results.

The plant is in charge of Louis P. Kraus, Jr., the brother of Charles Kraus, who is at the head of the Kraus laboratories.

Use of Sand Lime Brick Increasing in France

ACCORDING to an article by A. Merciot in the *Revue des Materiaux de Construction* the use of sand lime brick has increased greatly in France since the war. The reasons given are the difficulty of transport and the high cost of fuel, which have caused the making of sand lime brick as a local industry where the materials were available, as so much less fuel was required for their manufacture.

Tank for acid-treating clay

Grinding Silica and Feldspar

By R. L. CAWOOD

Abstracted from "Ceramic Industry"

IN silica and feldspar grinding plants, pebble mills of the continuous feed and discharge type, are used. These mills may or may not be operated in closed circuit with air separators but where large production is wanted, this is the more economical system. It consists of a ball mill or tube mill fed continuously and discharging continuously to an elevator which carries the ground material to an air separator which removes the fines and returns the tailings to the mill for regrinding. A circulating load is thus built up and as the fines are removed as fast as they are created, greater economy is secured than with the intermittent type mill or pebble mill. These systems are rapidly replacing machines of the batch type in the production of materials where large quantities are wanted.

For wet grinding buhrstone mills, or dragstone mills as they are sometimes called, were very extensively used up until about 40 years ago when the pebble mill began to make its appearance in wet grinding operations. Its progress has been continuous until there are today very few buhrstone mills or dragstone mills in operation. This is as it should be because the pebble mills are more easily handled, the product is kept cleaner and the grinding cost is materially lessened.

Geared mills are always more satisfactory in the long run. Many purchasers buy ungeared mills; that is, mills with pulleys mounted on the main shaft, with the mistaken idea that the investment will be less. As a matter of fact the mill alone does cost less but it is generally of lighter construction and it is necessary in almost every case to install a countershaft overhead as it is not possible except in isolated cases, to get a drive direct from line shaft to such a machine. When one takes into consideration the cost of the countershaft, extra belting, additional installation cost, and so forth, it generally equals the difference in cost between the ungeared and the geared mills. Where mills are placed on upper floors, and in almost every case, flexible bearings are the better for they will absorb any settlement in floors or in foundations. Machine cut gears make less noise than cast gears. In the pottery, porcelain and tile field, silex linings have become the standard except perhaps in some of the smaller mills where colors are changed often and in such cases, porcelain is generally used as it may be cleaned more easily than silex. Silex is a natural flint rock and the best of it comes from Belgium. Many grades are produced there. The very highest grade is of a dark gray color. It grinds off very white, however, and after being calcined, is perfectly white. It does not contaminate either glazes or enamels. The lower grades are lighter in color, sometimes with large yellow stains and with many holes. The very highest grade blocks are quarried and afterward cut to almost exact size. The lower grades are not cut close to size and consequently a lining laid up from such blocks is very rough.

A mill lined with such blocks must be "ground in" for a few days before being placed into actual service. In starting mills with silex linings, it is always necessary to place a charge of sand in them and to grind off projecting points of silex and superfluous cement. If the mills are to be used for wet grinding a second charge of sand together with water is placed in the mills and they are ground for several days before using.

Porcelain linings of the highest grade are made of a porcelain mixture that is not only very hard but is also very tough. It is only necessary to clean out a porcelain lined mill and it should not be "ground in" like the silex lined mill.

As to the grinding media, the most popular is the French pebble. The Danish pebble is occasionally used but these pebbles are dark and the structure is not generally considered as good for grinding.

In recent years, porcelain balls have found their way into the industry and are being used with considerable success. They are not as hard as the pebbles but have less tendency to fracture and chip. This may account for their popularity.

Increased Market for Glass Sand

THAT the market for glass sand has been stronger this year than in any preceding year is shown by the production figures put out by the plate glass manufacturers of America:

The production for 1926 should be in excess of 135,000,000 sq. ft., or nearly 18,000,000 sq. ft. more than was turned out in 1925.

New furnace flux stone loading plant of the Rockland-Rockport Lime Corp., Rockland, Maine

New Flux Stone Loading Plant of the Rockland-Rockport Lime Corporation

New England's First and Only Blast Furnace at Everett, Mass., Uses Maine Limestone

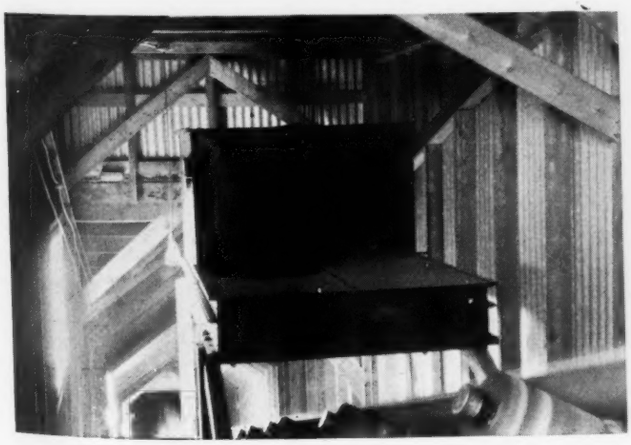
By Warren E. Hill
Rockland-Rockport Lime Corp., Rockland, Me.

ROCKLAND limestone meets the specifications for fluxing stone. In anticipation of this demand created for this product by the erection of New England's first and only blast furnace, located in Everett, Mass., the Rockland and Rockport Lime Corp. started the erection of a flux stone conveyor and storage system. The work was begun last September and the plant has now been shipping fluxing stone for several months.

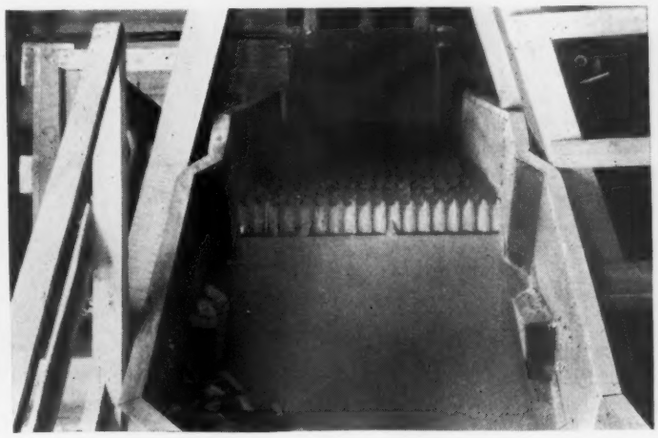
It is estimated that 70,000 tons of limestone will be used per year. Two 227-ft. barges with a capacity of 2000 tons each have been put into service to carry the stone from Rockland to Everett, Mass.

A track has been laid to the waste chip piles at the quarry, and a steam shovel loads these chips into rock cars set on this track. From here the cars go to the crusher, where alterations have been made for producing the proper size of flux stone. Approximately 100 cars of chips are needed each day.

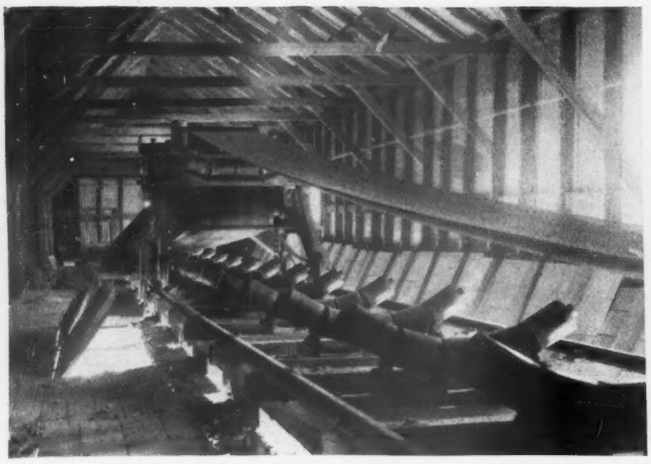
Air-dump cars carry the stone from the crusher and dump it into a large reinforced-concrete hopper with a rail bottom, which tapers from a width of 40 ft. at the track to a single 36x24-in. quadrant gate operated by hand. The stone is fed to a 30-in. belt conveyor by a Stephens-Adamson "live roll" grizzly. This is a device for propelling



Weightometer automatically keeps track of stone loaded out



Live-roll grizzly screens out everything under 2-in.



Tripper and 30-in. belt conveyor over ground storage

Trap doors opening over ground storage piles

stone and screening out pieces smaller than 2 in. in diameter. These pieces fall onto a shaking screen directly below, which screens out the pieces smaller than 1 in. in diameter. (This shaking screen is now being replaced by another "live roll" grizzly.) The pieces which do not pass through the shaking screen go on to the 30-in. belt with the larger rock. Those less than 1 in. in diameter are carried away on a 24-in. belt conveyor which dumps them into quarry cars on the spur track about 65 ft. away.

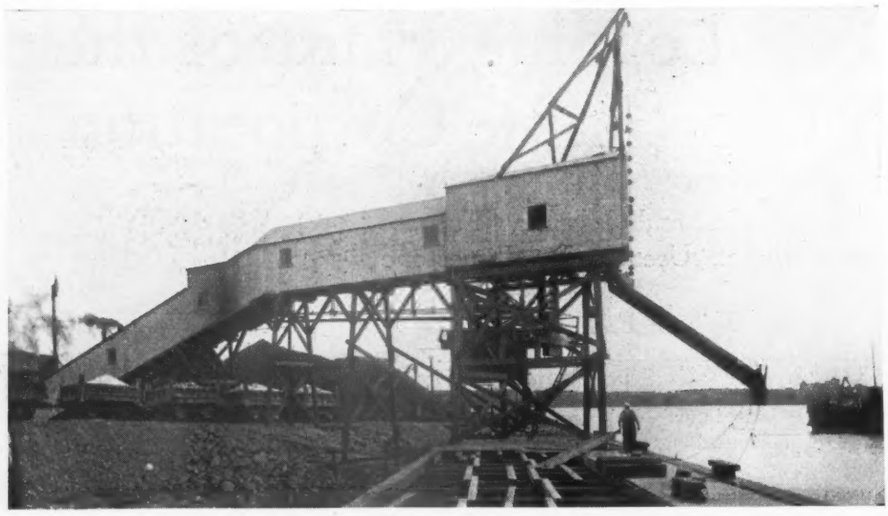
It is specified that the stone be at least 1 in. and not over 6 in. in diameter. The stone this size is taken up on the 30-in. belt conveyor, at a 15 deg. incline, to an approximate height of 50 ft. above the ground. It then strikes out level for about 130 ft. A self-propelled tripper travels on a track the length of this level gallery. This throws the rock from the belt into a two-legged hopper which directs the stone to either side of the belt on to the storage pile below. When the plant is in full operation a storage pile 40 ft. high in the center, 80 ft. wide at the base, and nearly 200 ft. long will fill the space below this high section of the conveyor gallery. A tunnel under the limestone storage provides for its removal.

Fifteen rack and pinion gates spaced along the roof of the tunnel are operated by hand and are the means of obtaining the rock from the pile. Another 30-in. belt conveyor runs the whole length of the tunnel and then goes up a 17.78 deg. incline to a point 10-ft. beyond the center of the Lime Rock R. R. track, which runs under the coal tower. It then strikes out level and on to a new 135-ft. section of the wharf.

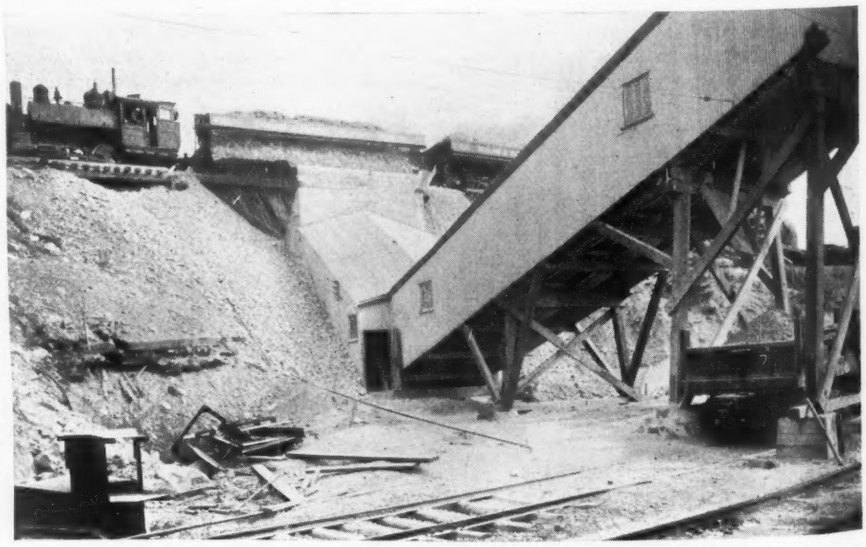
A hand-propelled hopper car moves on a track the length of the tunnel. The stone falls through the gates from the storage pile into the hopper car and from there goes on to the belt. At the end of the belt the stone drops through a 26-ft. steel cylindrical chute 2 ft. in diameter into a barge. When this conveyor is not in use the chute is lifted into a vertical position by means of a hand winch.

About 1200 ft. of 30-in. rubber belting will be used for the two conveyors. Two 30-hp. motors furnish the power to move them. A 15-hp. motor furnishes the power for the grizzly, shaking screen, and the 24-in. belt conveyor.

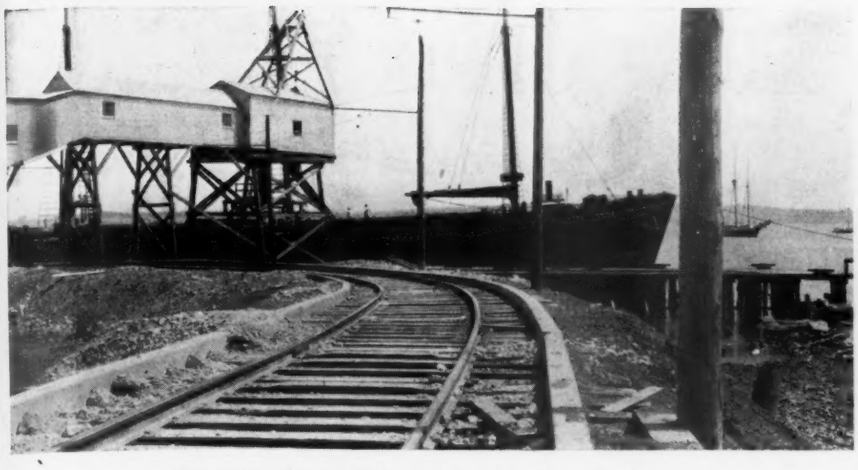
A Merrick "Weightometer" is installed to weigh the rock as it is conveyed to the ship-loading spout. When the signal is given that a barge is loaded, the operator can tell just



Wharf end of the loading plant—crossing over Lime Rock R. R.



Receiving end of limestone loading system



Sea-going barge being loaded for Everett, Mass.

how many tons of stone have gone into the barge by reading the figures on the dial of the weightometer.

The conveyors are fully protected from the weather by a corrugated steel gallery. The entire layout is modern in every detail and is without question the longest and most modern belt conveyor within a radius of many miles.

This new project will furnish added work for the quarries and the Lime Rock R. R., besides providing employment to several men in the operation and upkeep of the plant itself. It uses sizes of stone too small for the lime kilns.

The Stephens-Adamson Manufacturing Co., Aurora, Ill., designed the plant and furnished most of the equipment.

Manufacturing Phosphate by the Calcining Process

A Preliminary Note on a New Phosphate Process

By G. R. Brobst
Allentown, Penn.

IN order to describe the calcining process of manufacturing phosphate clearly it will be necessary to explain its development, for there are many features which would appeal to the phosphate industry as well as to scientific research.

The sources of phosphate rock are chiefly Florida and Tennessee. The United States is the largest producer of phosphate rock in the world, producing about 3,000,000 tons yearly. Tunis in northern Africa is the next largest producer, producing yearly about 1,000,000 tons. Florida produces more than one-half of all produced in America, or about 2,500,000 tons.

The deposits in Florida extend along the west coast with some deposits still undeveloped. The deposits in Tennessee are in the central part of the state and within 60 miles of Muscle Shoals. Most of the raw rock has been going to large cities like Baltimore, Md., and Philadelphia, Penn., in the east and Kansas City, Mo., and Chicago, Ill., in the north central states.

The phosphate is mined as a cement rock would be and it frequently occurs in strata horizontal to the surface. The rock is dried and pulverized very fine and then treated by the chemical companies with sulphuric acid of about 60 deg. Baume. The acid is valued at about $10 a ton and the phosphate rock at $5 to $6 a ton unground.

The pulverized rock is mixed with an equal quantity of sulphuric acid, thus cutting the strength or value of the phosphate in half. A good phosphate rock analyzes about 36% phosphoric acid, 42% lime or calcium oxide and about 22% silica plus iron and alumina. After the addition of sulphuric acid it will run about half these amounts, or 18% phosphoric acid, 21% lime or calcium oxide and 11% silica plus iron and alumina.

For years this increase in bulk has been noticed especially in the matter of freight rates as well as in the increased cost in handling. It has also been noticed that phosphate produced by the sulphuric acid process sometimes reverts to the unsoluble condition and that it occasionally cakes or hardens upon storage in bags.

A new process for producing phosphate has been tried and found equal to expectations. As early as 1914 I worked on this process. (U. S. Patent 1,360,246.)

By calcining phosphate rock, the lowering in percentages is reduced to a minimum, a matter by no means negligible in the matter of freight rates. The material is calcined to a clinker like cement clinker and reground. A 100 lb. bag of this grade is equal to a 200 lb. bag of the bulky grade. Phosphate by this process is stable and will not revert. It will hold its ammonia in whatever form mixed. Calcium cyanamide manufactured at Muscle Shoals may be used for the nitrogen in mixed fertilizers.

Costs Compared

The cost of the sulphuric acid process may be stated as follows: $5 a ton for phosphate rock, $10 a ton for sulphuric acid or $7.50 a ton producing 18% phosphate. The cost per unit per cent is 41 cents. Comparing with the calcining process, we require $5 a ton for phosphate rock, $6 a ton for fuel and limestone or other contact chemical cost of $11 a ton, producing at the lowest 30% phosphate at a cost of 36 cents a unit per cent. (See *Industrial and Engineering Chemistry*, March, 1924, p. 228.)

The above tends to prove that an 18% phosphate made by the acid process costs as much or more as a 30% phosphate made by calcining.

If the selling price is, or should be, 50 cents a unit per cent, the respective values would be $9 and $15, or a gain of $2.50 a ton, disregarding freight rates and handling costs.

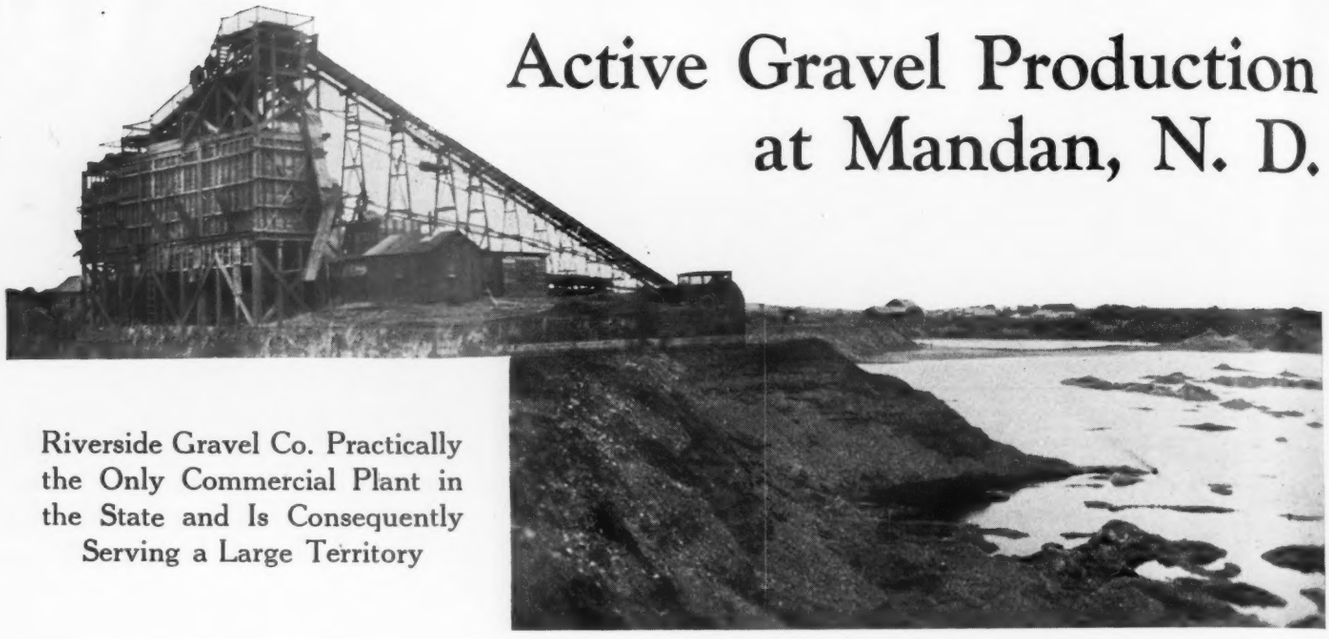
Quarry Accidents Reduced in 1924

A COMPARISON of the number of accidents and fatalities to quarry workers in the United States in 1923 and 1924 shows that the rate for 1924 among 94,242 employes was 1.63 fatalities per thousand full-time or 300-day workers, as compared with 1.68 in 1923, according to an announcement made by the Bureau of Labor Statistics of the Department of Labor. This is the lowest rate reported since 1911. The non-fatal injury rate during 1924, it was said, was 175.03, while in 1923 it was 176.04.

According to the announcement, the accidents to workers in this industry in 1924 resulted in 138 deaths and 14,777 injuries, and in 1923 in 143 deaths and 14,990 injuries. There were 59,126 men employed inside the quarry pits, and of these 96 were killed and 8990 injured, giving a fatality rate of 1.90 and an injury rate of 178 per 1000 or 300-day workers; outside the quarries, it was learned, at crushers, mills, rock-dressing plants, etc., there were 35,116 employes, of whom 42 were killed and 5787 injured, the fatality rate being 1.24 and the injury rate 170.61.

Of the 14,915 accidents reported by the quarry industry, according to the department's announcement, 138, or 0.92%, caused death; 13, or 0.09%, resulted in permanent total disability.

Active Gravel Production at Mandan, N. D.



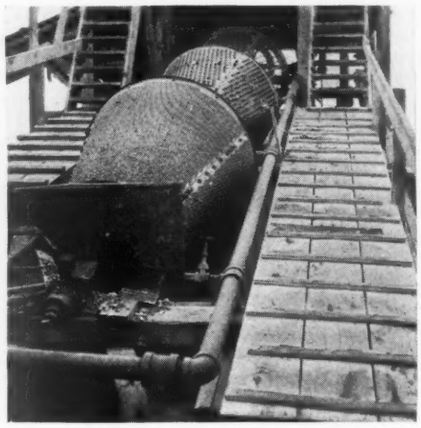
Riverside Gravel Co. Practically the Only Commercial Plant in the State and Is Consequently Serving a Large Territory

NORTH DAKOTA is practically without rock products industries. The state is one of large farms given to the raising of cattle and wheat, and while the larger towns have handsome modern buildings, they do not offer a sufficient market for large scale production of building materials. The entire rock products industry in the state, outside of small-scale production by contractors and others, is represented by the plant of the Riverside Gravel Co., near Mandan.

Some of This Material Is Shipped to Distant Construction Work

Mandan is on the other side of the Missouri river from Bismarck, the state capital. The towns are connected by six miles of excellent concrete road and other paved roads leading from the two towns are contemplated. Hence the highway work furnishes a considerable market for the plant and another market is furnished by the building which goes on in the towns themselves. As the plant is the only one producing first-class washed material it also ships its product to smaller places, many of them far away. Railway ballast in times past has formed a good part of the plant's production.

The deposit is of glacial origin and it is remarkable for the proportion of gravel it contains, which is at least two-thirds of the whole. It is about 30 ft. deep and extends a short and varying distance below the ground water line. The dragline excavator is thus the machine best adapted for excavating the material.



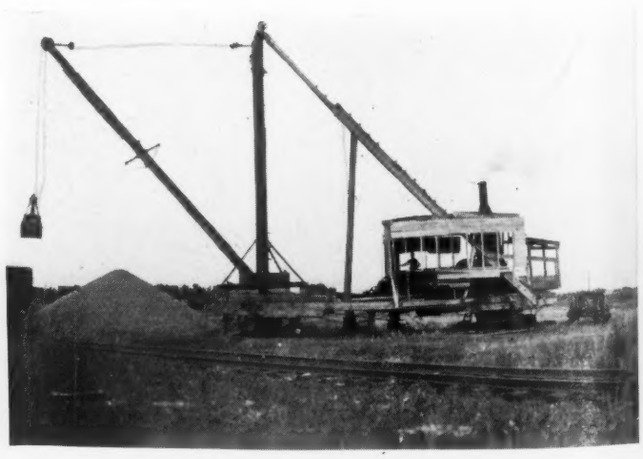
Conical screens at top of screening and washing plant

The company has two of these, one built by the Channon Co. and the other by the American Hoist and Derrick Co. The first is employed in excavation, the second in handling material in stockpiles. Both are steam-driven. The Channon machine has a 1-yd. bucket of the same make and the other a ¾-yd. Williams bucket.

Movable Hopper Saves Damage to Cars from Shock of Falling Material

The dragline bucket is dumped into a movable hopper which straddles the track to the washing plant. This saves the cars from the shock of the falling material. The cars are mostly "home made" and rebuilt second-hand, but all are of the side dump pattern. They are drawn in the washing plant over a 36-in. gauge track by a 4½-ton Whitcomb locomotive. The cars dump into a hopper

Dragline excavator and hopper over track



Second dragline handling material to stock pile

over a grizzly and the material is fed to a 20-in. conveyor belt that takes it to the screens at the top of the plant.

The grizzly oversize is so small in quantity that it can be sledged and added to the rest after breaking. Hence everything passes to the first screen, which has 3-in. round holes. The oversize of this screen falls through a chute into a hopper from which it is fed to a No. 8 Telsmith crusher.

At present the demand for gravel is for the finer sizes, so the undersize of the 3-in. screen is also crushed. The crusher discharge is lifted by a bucket and belt elevator to the second screen of the series, which has 1½-in. round holes and the oversize of this screen is returned to the crusher. But when a coarser product, such as railway ballast, is wanted, the crusher discharge is elevated to the 3-in. screen.

The undersize of the 1½-in. screen goes to a screen with ⅜-in. round holes. The oversize of this goes to the gravel bins, the undersize to two 6-ft. Dull cones in series. The first makes coarse sand for fine aggregate and similar purposes and the second fine sand for plastering and similar work.

Kerosene Used for Fuel in Oil Engine

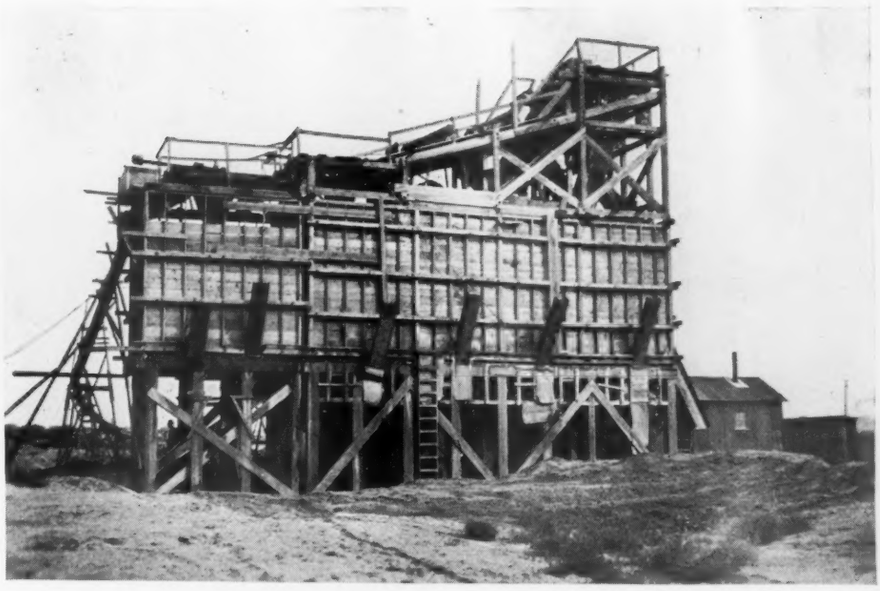
The washing plant is of Link-Belt design and all the machinery for it, except as otherwise stated, was furnished by this company. Power is furnished by a Type Y Fairbanks-Morse oil engine in which kerosene is used for fuel.

About 500 g.p.m. of wash water is used, the water coming from the pit. As the material is stripped there is not much left to wash from the gravel and sand and the product which was examined appeared very clean.

The plant production averages 450 tons per day.

The office of the company is at Mandan. J. H. Newton is president and F. M. McAuliff is the manager.

The company furnishes aggregate to a plant of the North Dakota Concrete Products Co. on adjoining property, which makes concrete pipe, mainly used for culverts in highway work. The plant is situated near the washing plant and uses the regular sand and gravel which it mixes in the right proportions. Pipes of 12-in., 15-in., 21-in., 27-in. and 30-in. internal diameters are made, all by pouring wet concrete into steel moulds. The concrete is mixed by machine and poured and tamped by hand. Wire reinforcing welded into cylinders is used. The same company has plants at Watertown, Mitchell, S. D., and Elk River, Minn.

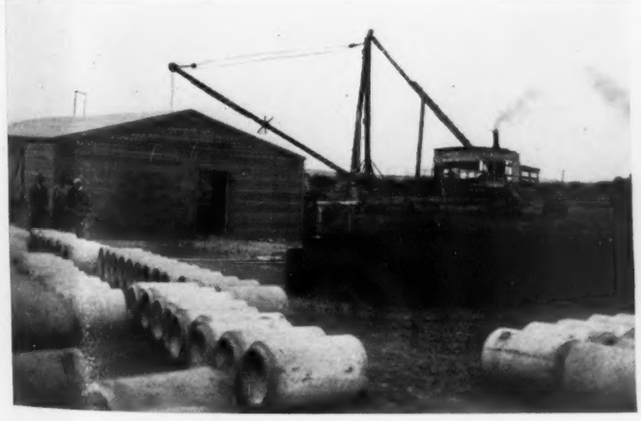


Trucks are loaded on this side of the plant for delivery to local building and highway construction

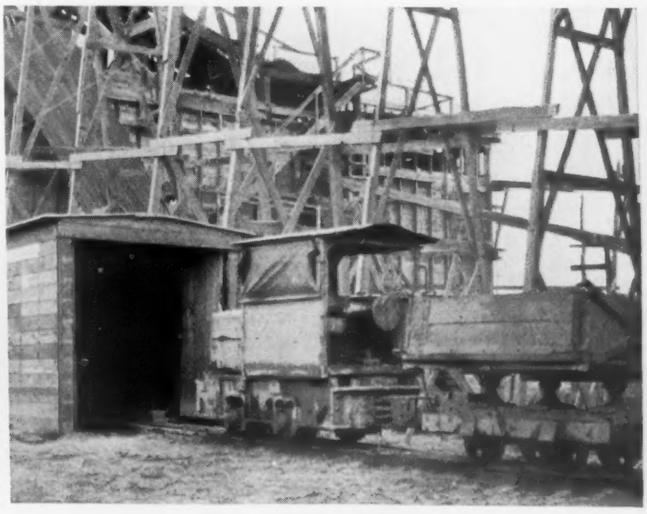
Two Accidents from Electric Power on the Same Day

THE importance of protecting employes against the dangers of shorting electrical circuits is emphasized by the fact that two such accidents occurred in Indianapolis gravel pits on August 25. In one case a man was killed by the guide wire to an electric hoist coming in contact with a live wire. In the other case a man who was loading a gravel truck touched a water pipe which had short circuited a line carrying 4200 volts. He was rendered unconscious, but subsequently recovered.

Screen oversize goes to this crusher



Plant of North Dakota Concrete Products Co.



Gasoline locomotive and side-dump cars handle material

Some excellent Philadelphia examples of lime stucco

Making a Specialty of Lime Stucco and Plaster

Methods of Manufacture and Application Practiced by Successful Philadelphia Builder

LIME STUCCO is one of the oldest materials used in finishing the exterior of a building, and there are plenty of examples in Europe and America which have resisted the elements for more than a century. But the older methods of applying it are too slow and too laborious for modern building methods. For this reason lime stucco went out of use in some places. There are towns in the newer parts of the country where it is hardly known, other cementitious materials having been used from the first. But in Philadelphia it never went out of use entirely, and lately it has considerably returned to favor in that city. This is due in great part to the work of J. P. Mollenkof, who superintends the stucco, plaster and artistic concrete work for J. H. McClatchy, a large scale builder of Philadelphia homes.

Those who attended the convention of the National Lime Association at French Lick, Ind., will remember Mr. Mollenkof's paper on the use of lime in stucco and plaster, which was one of the features of the convention, since it told the makers of lime some things about its uses of which they themselves were ignorant. The matter seemed of sufficient importance to warrant an independent study by ROCK PRODUCTS, which is why this article was prepared.

Mr. Mollenkof comes naturally by his liking for plaster and stucco work, for his father was a plaster contractor and the son learned to handle a hawk and trowel almost as soon as he was able to hold them. Later he wanted to become a sculptor and studied with that end in view. He practiced clay modeling as a trade for four years. Then the war came and in common with many other men he thought he ought to get into an industry of military importance and went to work in a steel mill. He grew interested in machinery and methods, studied hard, and rose pretty rapidly, but at the end of the war went back to his work of clay modeling, applying his skill to the making of molds for concrete trim and ornamental work. Mr. McClatchy bought much of this material from him and at length persuaded Mr. Mollenkof to enter his employ.

Lime is slaked by hand in 6x24-ft. box

To speak truthfully, the lime stucco should be called a lime-cement stucco, as considerable portland cement enters into its composition. For interior work Mr. Mollenkof uses a lime-gypsum combination, so it will be seen that his preference for lime as a basis is not due to prejudice against other materials. He has merely tried to find the combination of materials that would be best adapted to his methods and, above all, that would be permanent.

In preparing this article a great many houses and some other buildings were examined, and only one case of failure of the exterior stucco was noted. That was on wood lath, and the stucco was applied by a man not familiar with the material, as the building was not erected by the McClatchy organization. Which brings in the matter of workmanship. Plastering is a skilled trade and amateur work is almost surely doomed to failure. Mr. Mollenkof finds workmanship quite as important as materials and takes the trowel and hawk and goes on the scaffold himself whenever it is necessary to explain the work to new men.

Plaster and stucco are prepared in a central mixing plant at 69th and Chestnut streets, Philadelphia. The building is of a temporary sort, for it is on land that it was known would soon be valuable for building, and even now the ground beside it is being leveled and prepared for building sites. A great many buildings have used the product of this plant; there were 880 dwellings built by Mr. McClatchy last year. To those in-

tending to go into the mixed plaster business, Mr. Mollenkof's conclusions regarding central mixing plants may be of interest. He does not believe it pays to erect a plant for less than 300 to 400 ordinary dwellings, and even then the plant should be of a simple and inexpensive type. The radius of trucking, in his opinion, should be kept within five miles.

The lime used comes mainly from the Cedar Hollow plant of the Charles Warner Co., although other limes are used occasionally. It is rather slow slaking and the method of making putty has been adapted to the lime.

Slaking is done by hand in a box 24 ft. long, 6 ft. wide and 2 ft. deep, made of 2-in. plank. At one end is a screen on which pieces of core or foreign materials are screened out after the lime is slaked. The workman first puts an inch or two of water in the bottom of the box and shovels in lime to a depth of 6 in. Water is added only in sufficient amount to keep the lime from burning, and the slaking lime is not stirred. It is Mr. Mollenkof's belief that slaking is more thorough if there is no stirring, as the lime putty has no chance to coat the unslaked pieces. After the lime has been slaked the putty is washed down through a trough over a screen to a long wooden settling vat. It is allowed to age in this vat for at least a month before it is used. When it is needed for plaster or stucco it is dug out with a shovel and wheeled to the mixer.

Several kinds of aggregate are used. For interior plastering a fairly fine sand from Tulleytown, Penn., is most used, but a special silica sand from Millville, N. J., is used in finish coats. This is put over a shaking-screen with about a No. 16 mesh cloth to free it from large grains.

For stucco, crushed pebbles from Cape May have been found the best aggregate for the finish coat on account of the texture given to the surface. These pebbles are between ¼ in. and ⅝ in. in diameter and are an excess product in most sand operations in southern New Jersey as they are in the territory about Indianapolis and on the Pacific coast at Seattle and Spokane, in Wisconsin, and some other places. Any use for them is therefore to be welcomed.

Old tavern in Germantown, near Philadelphia, covered with stucco which has resisted the elements at least half a century

Crushed quarry spalls from Texas, Maryland, are used where a white stucco aggregate is wanted. These are almost pure crystallized calcite. They are crushed in a New Holland jaw crusher and generally mixed with the crushed Cape May pebbles. The pebbles are crushed in a little crushing plant which was originally fitted with a screen. But Mr. Mollenkof finds that setting the crusher to a ⅛-in. opening gives him just the product he wants without any crushing of oversize.

Both sand and pebbles are taken to hoppers above the mixer by elevators. The bottoms of the hoppers have simple measuring devices so that the same quantity can be added to the mixers each time. Lime putty is measured into the mixers by buckets and cement by the sack. It is to be noted that most of the formulas call for one sack of cement, the other ingredients having been adjusted to this.

The mixer is a Blystone, 14 cu. ft. capacity, electrically driven. It dumps into a hopper and chute above the truck that is to be filled. The trucks have an underground driveway below the plant down which they are backed into the loading position.

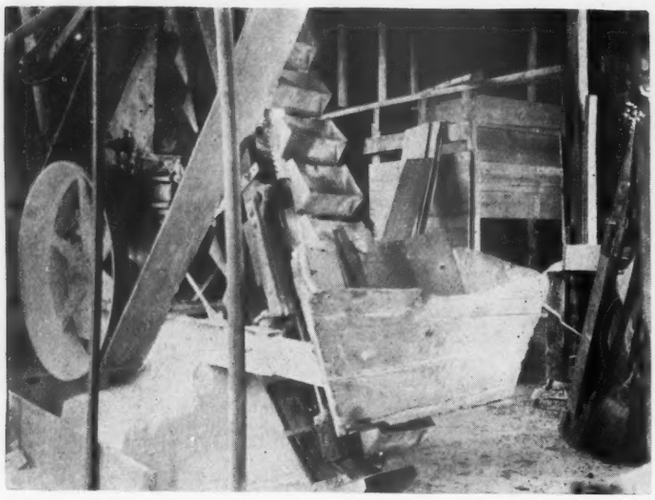
The stucco formulas are as follows:

SCRATCH COAT

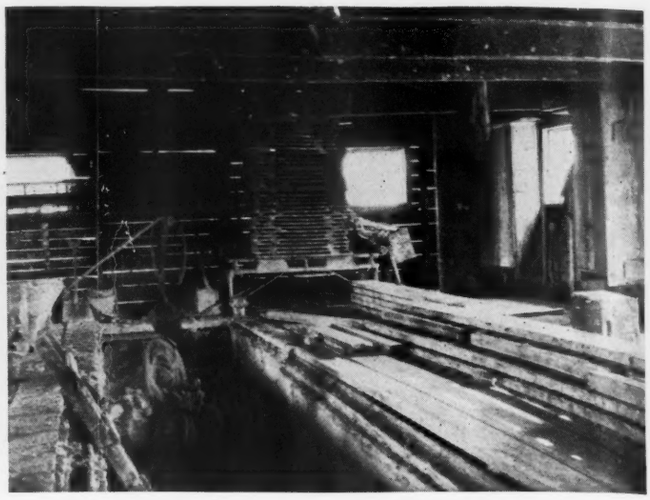
2½ cu. ft. lime putty
1 sack portland cement (1 cu. ft.)
8 cu. ft. Tulleytown fine sand

Mixer under floor and measuring hoppers above

Small shaking screen used in preparing plaster sand



Elevator and jaw crusher for fine grinding of aggregate



Shoveling putty from a hardening vat

If this is to go on metal lath, 1½ lb. of mixed hair and wood fiber are added, but not if it is to go on concrete block.

SECOND COAT

2 cu. ft. lime putty
1 sack portland cement
8 cu. ft. sand

No hair or fiber is added to this.

FINISH COAT

2 cu. ft. lime putty
1 sack portland cement
8 cu. ft. crushed pebbles or quarry spalls

No hair or fiber is added.

Stucco goes on over metal lath (under which is "ruberoid" waterproof paper) or on concrete block without lath or paper. In either case the scratch coat is put on about ¼ in. thick. Then while it is soft it is gone over with a scratch tool both ways to make a good bonding surface. Mr. Mollenkof considers this a very important feature of the work that should never be neglected.

Concrete block must be thoroughly wet down with a hose before the scratch coat is put on.

The scratch coat is allowed to dry for at least two days and then the second coat is added. This is about ¼ in. thick, but the thickness is varied in order to level up the work. The finish coat goes on immediately after the second coat; in fact, a workman follows the man who is putting on the second coat, finishing as fast as the surface is ready. In finishing, the surface is left rough, the plaster being "dragged up" by a sweep of the trowel.

Color is added at the mixer as required. Having had an artist's training, it is not strange that Mr. Mollenkof should be very successful in his color effects. Some of the interior finishes in color are unusually beautiful, especially those in pastel shades and self-tones. The colors used are the ordinary metallic oxides and the like bought from the regular dealers.

Waterproofing compounds have been used experimentally, but Mr. Mollenkof believes waterproof stucco is more a matter of good workmanship than anything else, although the older stuccos that have lasted so long always contained a waterproofing ingredient.

For interior work the formulas are:

SCRATCH COAT

4 cu. ft. lime putty
½ sack portland cement
8 cu. ft. sand
½ lb. hair
½ lb. fiber

BROWN COAT

2 cu. ft. lime putty
½ sack portland cement
8 cu. ft. sand
1 lb. hair (no fiber)

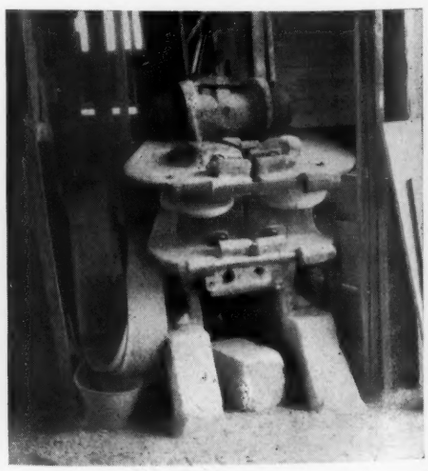
The hair may be left out of this coat in some cases.

WHITE COAT

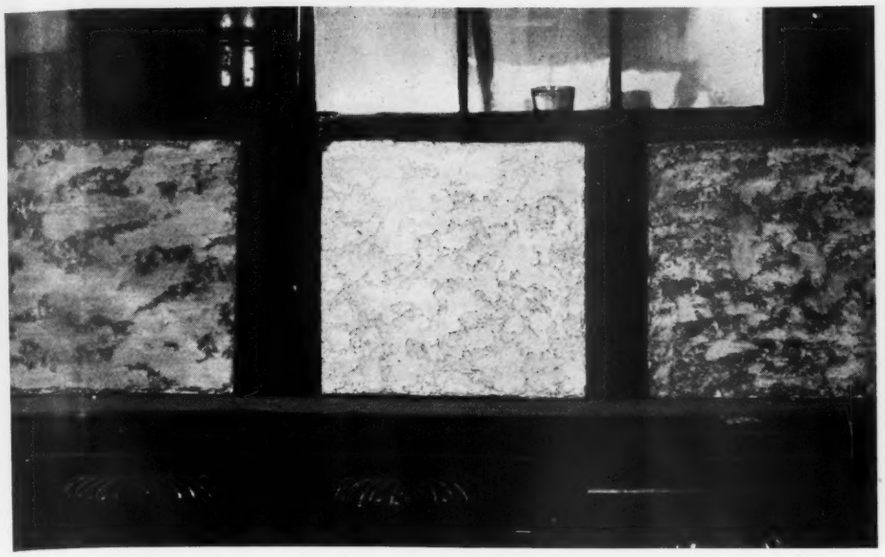
2 cu. ft. Ohio hydrate, well soaked
¼ cu. ft. clean white sand
4 quarts calcined gypsum
Water as needed

The sand is made in a ring and the water and gypsum mixed in as the plaster is used. Some variation is allowed in this mix, according to conditions. But Mr. Mollenkof

Plant where stucco and plaster are mixed



Jaw crusher used for crushing quarry spalls



Panels showing different designs of interior finish

thinks it poor economy to leave out the gypsum.

By way of comparison it may be worth giving the mixes used for lime stucco a half century ago. These were obtained from Mr. Mollenkof's father.

SCRATCH COAT

2 volumes of plastering sand
1 volume of lime putty

SECOND COAT

3 volumes of sand
1 volume of lime putty

The lime was slaked on the job and a little tallow was melted and stirred into it thoroughly while the lime was hot. This was the usual waterproofing ingredient referred to above, although other substances were sometimes used. The scratch coat was put on and allowed to harden for as long as possible before the second coat was applied. A "float finish" was given the second coat, that is, water was thrown upon it and it was worked over and over to get a very smooth and dense surface. The process was laborious but the results were excellent, as is shown by a picture of the old tavern in Germantown. The stucco has resisted the weather for at least a half century. There are many fine examples of old stucco in this part of Philadelphia, some of which are said to be more than 100 years old. One which looks as fresh as though it were put on yesterday has been preserved by giving it a coat of lime whitewash every two years.

J. P. Mollenkof

Plant Control Over the Grading of Stone

By A. T. GOLDBECK
Director, Bureau of Engineering, N.C.S.A.

EVERY crushed stone plant should have on hand a set of laboratory screens of the sizes called for in the specifications, and possibly two sets may be necessary, for some specifications state the size in terms of round openings and some in terms of square openings. In addition, a small platform scale will be required. Then from time to time "mechanical analyses" or "sieve analyses" should be made of the product. Such analyses will serve several very useful purposes. In the first place, practically all specifications describe stone sizes in terms of laboratory screens and not plant screens. It is not sufficient for you to know that you have used certain size openings in your plant screen, for that alone does not insure the production of stone graded to the proper size. A number of variables besides sizes of openings in plant screens will influence the grading of the final product. These variables include diameter and pitch of revolving screen, the load it is carrying, the length of sections, speed and moisture condition of the stone, and no doubt others. A frequent check between laboratory screening and plant screening will finally lead to a knowledge of the effect of these different plant variables and the steps to be taken to insure the desired laboratory sizes. Then, too, a better control over the sizing will lead to fewer rejections. You do not know that your stone is complying with specifications until it is tested.

All cement mills, and some stone plants, are now controlling their product by testing it at the plant. A number of your rival aggregate producers are likewise exercising plant control. You cannot afford to let producers of the other aggregates have better control over their product than you have over yours. If anything, the reverse should be true, for you must be able to emphasize superior quality, superior uniformity and superior grading.

Every crushed stone producer should have laboratory screens at his plant and with them he should control the grading of his product. Why not institute a system of plant control; then, why not advertise that fact?—*N. C. S. A. Bulletin No. 4.*

Progress in Rock Dusting of Coal Mines

THE American Engineering Standards Committee has just approved as "Recommended American Practice" a safety code for rock dusting of coal mines, developed under the sponsorship of the American Institute of Mining and Metallurgical Engineers, in close cooperation with representatives of the various national bodies interested, including state officials having regulatory power over the field in question, coal operators, labor, inspection, insurance, manufacturers of mine equipment, and the U. S. Bureau of Mines. The latter, as a leader in mine safety work, has conducted extensive investigations and experiments under the direction of George S. Rice.

The code prescribes the rock dusting of mines producing bituminous coal, or lignite, whether gaseous or not, as they are liable to dust explosion. It specifies the kind and amount of dust to be used and the parts of the mine to be dusted. The methods of applying the dust and instructions for its sampling are also given.

The practice of wetting coal dust produced by coal undercutting machines and the drenching of the cars with a water spray, while they are in transit, are recommended as effective and economical ways to keep down the dust from these sources.

A report by Edward Stidle, supervisor of the Cooperative Coal Mining Courses at Carnegie Institute of Technology, who has been making a study of this subject in connection with the Bureau of Mines investigations, presents data on the increase in the use of rock dusting during the past year, which emphasizes the importance which coal mine operators place on the prevention of explosions. During 1924 only one company in America practiced rock dusting on any large scale, but at present no less than 211 mines are rock dusted. However, this represents only about 4% of the total number of bituminous mines in the United States.—*Mineral Resources of Tennessee, 1925.*

New York State Crushed Stone Association August Meeting

Visit Gouverneur Limestone Company Plant and Hold Session on One of the Thousand Islands

NO weighty subjects were before the August 27 monthly session of the New York State Crushed Stone Association... In keeping with the season, the weather, the place and the company, every one devoted his time to cultivating those ties of friendship and good fellowship which mean more to healthful associations than erudite deliberations on the status of the industry.

Some 25 members from various parts of New York state motored first to Gouverneur, where the crushing plant and quarry of the Gouverneur Limestone Co. were inspected. This company is the result of a little agricultural limestone enterprise started by H. H. Hodgkin and G. W. Dodds. The present plant was built in 1923. Quarrying is carried on in a pit quarry at the foot of the plant incline. Loading is done by hand. The material is very pretty crystalline high calcium rock.

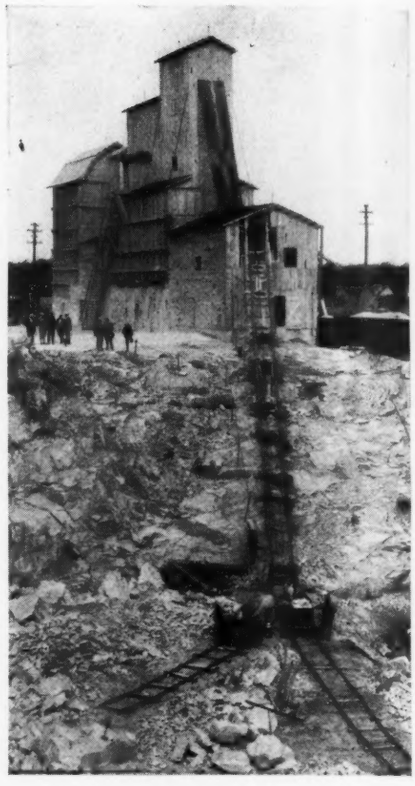
The initial crusher is 12x24-in. Good Roads Machinery Co. jaw crusher, and the secondary crusher is a 12x16-in. jaw of the make. For making agricultural limestone a Bradley ring-roll pulverizer is used. The plant has a capacity of about 300 tons per day. The smaller sizes of crushed stone are readily marketed for chicken grit and terrazzo. Chemical stone for the paper mill trade forms a considerable item in the plant's output.

As a whole the operation furnished an interesting example of what enterprising men may do with a comparatively small quarry operation of good quality limestone. Most of the members of the association visiting this plant have vastly large tonnages, but few could show the same variety of uses and markets for their product.

A by-product plant making cement block and pipe utilizes the screenings not required for agricultural limestone. All the fine aggregate in these products is limestone screenings, and prettier and more durable cement products would be hard to find. A motor-driven Anchor block machine is used for the blocks. The pipe are made of poured concrete.

From Gouverneur the party drove to Alexandria Bay, where an enjoyable luncheon was served, following which all the members went aboard a fast motor boat and were shown a few score of the "thousand islands"—a most pleasurable two-hour cruise on the St. Lawrence river.

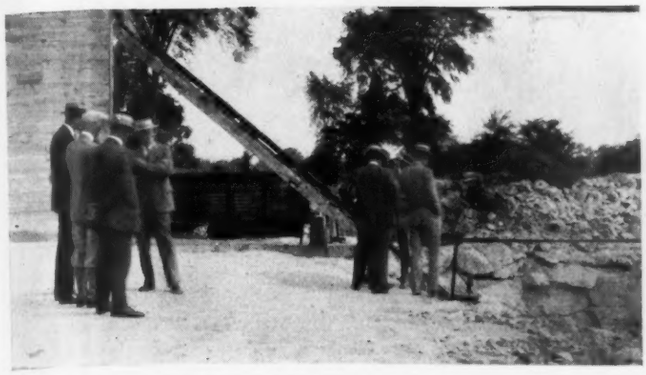
Late in the afternoon a landing was made on Bolt's island—containing an unfinished "castle," reputed to have cost its builder $3,000,000. Here in a stone pavilion under the trees, the meeting convened, and the customary monthly business was transacted. After the meeting the party inspected the unfinished castle, which must represent nearly $1,000,000 worth of quarry products.



Crushing plant of the Gouverneur Limestone Co., Gouverneur, N. Y.

Members of the New York State Crushed Stone Association at Alexandria Bay, N. Y., about to start on excursion

Stone pavilion on Bolt's island, St. Lawrence river, where the August business meeting was held



Inspecting the quarry and plant of the Gouverneur Limestone Co.

The cement products plant of the Gouverneur Limestone Co.

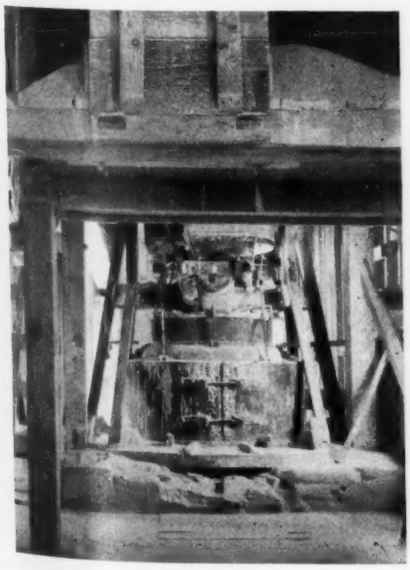
Besides Messrs. Hodgkin and Dodds, already referred to, the hosts of the occasion were E. B. Johnson and U. S. Adams of Adams and Duford Co., Chaumont, N. Y., and S. D. Ormsby of the Watertown Stone Products Co., Watertown, N. Y.

State Highway Specifications for the Grading of Sand

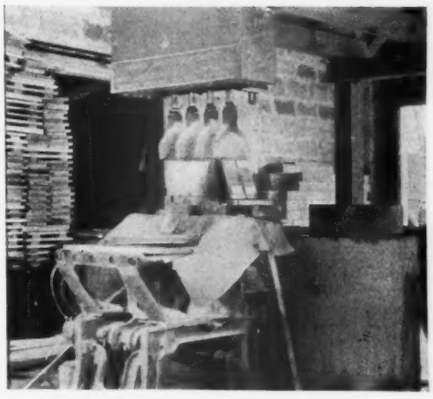
STANTON WALKER, director of the engineering and research division of the National Sand and Gravel Association, has made an important study of the specifications for sand issued by various highway departments which is published in one of the regular bulletins issued by the association. He takes California, Ohio and New Jersey as states showing the present day tendency to establish more rigid grading requirements. The required gradings for these states are:

CALIFORNIA

Passing No.	3 std. sieve	90 to 100%
Passing No.	10 std. sieve	55 to 80%
Passing No.	20 std. sieve	30 to 55%
Passing No.	30 std. sieve	15 to 35%
Passing No.	40 std. sieve	10 to 25%
Passing No.	80 std. sieve	0 to 10%
Passing No.	200 std. sieve	0 to 3%



Agricultural limestone pulverizer



Interior of block plant

OHIO

Passing ¼ in. screen	Not less than	95%
Passing No. 10 sieve		70 to 90%
Passing No. 20 sieve		35 to 80%
Passing No. 50 sieve		5 to 25%
Passing No. 100 sieve	not over	5%
Silt by weight	not over	3%

NEW JERSEY

Passing	*Retained on*	*Minimum*	*Maximum*
½ in. screen	¼ in. screen	.....	5.0%
½ in. screen	10-mesh	5.0%	25.0%
¼ in. screen	10-mesh	5.0%	25.0%
10-mesh	30-mesh	30.0%	60.0%
30-mesh	50-mesh	20.0%	40.0%
50-mesh	200-mesh	5.0%	25.0%
200-mesh	.....	.....	5.0%
Silt per cent by weight			4%

Discussing the various state specifications, Mr. Walker makes the following comparisons:

One-fourth Inch Screen. Twenty-six states require that 100% pass the ¼ in. screen or its equivalent. All but six of the remainder permit up to 5% retained on this sieve; that is, require that at least 95% pass. Kansas, New Mexico and Pennsylvania permit as high as 15% coarser than ¼ in., while California, Michigan and Oregon limit the amount coarser than ¼ in. to 10%.

No. 50-Mesh Sieve. All but six states place limitations on the maximum amount of material passing the No. 50 sieve; the exceptions place such limitations on the No. 30 sieve that probably an equivalent result is obtained. In most cases the maximum limit is between 20 and 30% with no limitation on the minimum; the only exception is Minnesota, which limits the amount passing the No. 50 sieve to 15%. In addition to the states discussed above, Alabama, Nebraska and Virginia have a minimum limit on the No. 50 sieve of 5% and Michigan 7%.

No. 100-Mesh Sieve. All states except Kansas, Oregon and Washington place limitations on the amount of material passing the 100-mesh sieve. In most cases the requirement is that not more than 5% pass, although several states go higher than this—California, Maryland and West Virginia permitting as high as 10%. Only one state places the limit lower than 5%, Arkansas placing it at 3%.

Amount of Silt. All states with the exception of California, Oregon and Washington place a limitation on the amount of silt removed by elutriation. The majority of the states permit as high as 3% by weight. Only New Jersey permits a higher value than this, allowing as much as 4%. Colorado and Iowa place the limit for silt at 2½%, while Illinois, Indiana, Kentucky, Michigan, Minnesota and Missouri allow no more than 2%. Of the states which place no limitations on silt, California specifies that not more than 3% shall pass the 200-mesh sieve, a practically equivalent requirement, while Oregon and Washington take care of it only by their general statements concerning cleanness.

Intermediate Sizes. Seventeen states place no limitation on the intermediate sizes between the ¼ in. screen and the 50-mesh sieve. Of the 31 states remaining, 23 place the limitation on the No. 20 sieve. Generally only the maximum is specified and in most cases this is between 70 and 80%. Exceptions are Florida, which permits as high as 85%; Michigan and Minnesota, with a limit of 65% and California with 55%. The remaining eight states place the limitations on the No. 30 or No. 10 sieve or both; the limitations on the No. 30 generally run from 40 to 50 as the maximum limit with no lower limit; exceptions are California and Washington, each of which specify not more than 35 nor less than 15.

Rodgers Company Receives Large Order

THE Rodgers Sand Co. Pittsburgh, Pa., has received a contract to deliver 100,000 tons of sand and gravel to be used in the construction of the by-products addition to the Clairton plant of the Carnegie Steel Co. on the Monongahela river at Clairton. This material will be dredged from the Allegheny and Ohio rivers. Delivery of this material will be made as fast as it is needed at the new plant.—*Monongahela (Penn.) Republican.*

The Design of Stone Crushing Plants

Part V.—Medium-Size Plant with Jaw Type as the Primary Crusher

By Hugo W. Weimer
Consulting Engineer, Milwaukee, Wisconsin

A DETAIL description together with illustrations and flow-sheet of an existing plant is always of interest to operators. But with the writer's method of discussing an imaginary proposed plant, certain problems can be taken up which can be best brought to the attention of the operator by this manner of treatment.

The two lay-outs, as described in the June 26 and July 24 issues of Rock Products included nothing new or novel as far as design was concerned, but did illustrate the method of which engineers make their preliminary plans. In this article the writer will discuss a plant that contains several features worthy of note. To the readers who have not followed the writer's previous articles, which have appeared in alternate issues of Rock Products since January 23, the writer wishes to state that these articles contained information on the various machines, such as crushers and screens, which is used for reference in the design of the plant discussed in this article.

A 100-Ton per Hour Plant

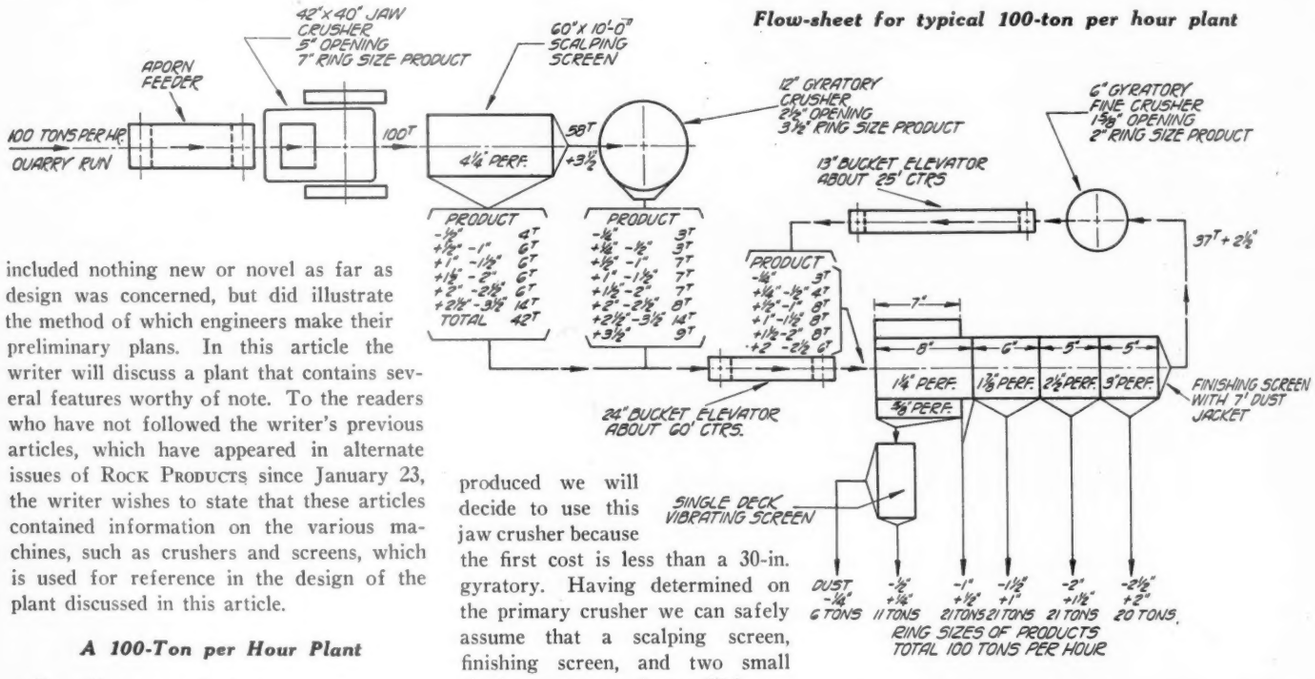
For this proposed plant we will assume that a capacity of 100 tons per hour is required and that the material is fairly hard limestone which is to be crushed to produce a number of sizes of product, more especially material of a small size. Since the capacity is to be based on 100 tons per hour, we naturally will assume that a shovel is to be used in the quarry for loading the cars. An imaginary examination has shown us that the material when crushed breaks in such a manner that few slabs are produced; thus the primary crusher may be of the jaw type if so desired. In the article published August 21, quarry shovels and their relation to primary crushers was fully discussed. By referring to Table II of that article we find that for the primary crusher a 42x40-in. jaw type or 30-in. gyratory type crusher would be suitable. Table I of this same article gives us the information that for either one of these crushers a quarry shovel with a 1½-yd. dipper would be suitable. We shall therefore decide that the quarry shovel shall be equipped with a dipper having a capacity of 1½ cu. yd.

Deciding on Primary Breaker

To decide on what type of primary crusher to use we find that the 42x40-in. jaw crusher has sufficient capacity, and as we are reasonably sure that no objectionable slabs will be produced we will decide to use this jaw crusher because the first cost is less than a 30-in. gyratory. Having determined on the primary crusher we can safely assume that a scalping screen, finishing screen, and two small sized gyratory crushers will be required. Since it is our desire to produce a great deal of small sized material, we will endeavor to use one gyratory crusher of the standard type and the other of the type known as finishing or fine reduction crusher. Gyratory crushers of this type were illustrated in the articles appearing January 23, March 6 and May 15.

We shall endeavor to lay out this plant so that the total tonnage as it comes from the jaw crusher is spouted into a scalping screen which removes the fine material, and the larger material is spouted into a gyratory crusher. The product from this crusher as well as the fines from the scalping screen shall be spouted into an elevator and conveyed to the finishing screen. Instead of the customary method of returning the oversize from the finishing screen to the original gyratory crusher we shall spout this material into a secondary gyratory crusher and return the product to the finishing screen by means of an independent elevator. This arrangement is clearly shown on the flow-sheet, but it is of course necessary to calculate each unit theoretically to find out if this arrangement would be practicable. To be a practicable arrangement it must include equipment of reasonable first cost, and, what is equally as important, each machine must perform sufficient work as compared to its rated capacity, which means that a properly balanced plant is what we require.

Flow-sheet for typical 100-ton per hour plant



Determining Correct Crusher Opening

Having decided on the steam shovel and the size and type of primary crusher as well as a possible lay-out for the balance of the equipment, it is necessary that we again refer to the jaw crusher to decide what opening would be best both from the viewpoint of capacity and suitable size of product for the following crusher. From the table of jaw crushers in the article of April 3 we note that the smallest ring size of product for a 42x40-in. jaw crusher is given as 5½ in. with a capacity of 120 tons per hour. This is a trifle too close to our required capacity and we will assume that a 7-in. ring size would be satisfactory for the following crusher and we can safely figure that the capacity would be about 140 tons

per hour. This figure is satisfactory and, as explained in the January 23 article, the opening should be equivalent to about 70% of the ring-size product—which in this case would give about 5 in. as the crusher opening. It naturally follows that to obtain the maximum capacity from a plant the feed to it should be made as continuous as possible with an even volume. It is more difficult to accomplish this with a jaw crusher than with the gyratory type, although for either type it has been found that a feeding arrangement for the primary crusher works out very satisfactorily.

Fig. 1 illustrates an apron type feeder showing how the material is discharged from the quarry car on to this feeder and then into the jaw crusher. While the discharge from the quarry car is necessarily intermittent, the operator regulating the apron feeder can readily arrange to feed the jaw crusher very evenly. There is not the slightest question but the cost of this feeder should not deter anyone from its use, because it certainly will add greatly to the efficiency of the plant.

Secondary Crushing

For the scalping screen, we note by referring to Table I of the May 1 issue, we will require a screen of 60-in. diameter. Before determining the length, which is governed by the screen perforations, we will have to discuss the following gyratory crusher.

Since the jaw crusher produces a 7-in. ring size product with pieces that will probably go 8 in., we are certain that the opening of this gyratory crusher will have to be more than 10 in. The product from the jaw crusher is classified according to size as shown in Table I, which is based on the information given in the May 29 issue. From this we note that out of the total of 100 tons, 28 tons is minus 2½-in. and 72 tons plus 2½-in. ring size material. From the gyratory crusher table of January 23 we note that a 12-in. gyratory has a capacity of 50 tons per hour of material crushed to 2½ in. This is not sufficient and therefore we will either have to install two gyratory crushers at this point or one large crusher, or reduce the amount of feed. This latter method can be used by passing larger pieces through the scalping screen to be recrushed by the next gyratory. If we make the division point of the scalping screens at 3½-in. ring size, this crusher will be required to take a feed of 58 tons per hour; and from the gyratory crusher table we can safely assume that if this crusher is also set to produce 3½-in ring size, it will easily handle the required tonnage. Therefore we will decide to do this, which will give various sizes of product as shown in Table I.

TABLE I—ANALYSIS OF CRUSHER PRODUCTS

Ring Sizes, inches	42x40-in. Jaw Crusher 5-in. Opening 7-in. Ring Size Total 100 Tons		12-in. Gyratory 2½-in. Opening 3½-in. Ring Size Total 58 Tons		6-in. Gyratory 1⅝-in. Opening 2-in. Ring Size Total 37 Tons	
	Percentage	Tons	Percentage	Tons	Percentage	Tons
—¼	0	0	5	3	8	3
+¼ —½	4	4	5	3	12	4
+½ —1	6	6	12	7	21	8
+1 —1½	6	6	12	7	22	8
+1½ —2	6	6	12	7	22	8
+2 —2½	6	6	14	8	15	6
+2½ —3½	14	14	25	14	0	0
+3½	58	58	15	9	0	0
Total	100	100	100	58	100	37

The scalping screen therefore is required to screen out all material minus 3½-in. ring size, and from the articles of May 1 and May 29 we determine that a 4¼-in. round perforation is required and that a length of 10 ft. will be satisfactory.

For the elevator we will decide to use a 24-in. bucket, which is in accordance with the information given in Table IV of the May 29 issue.

The next item to be considered is the finishing screen, which we know must be 60-in. diameter, and the length of course is determined by the number and sizes of product desired. The flow-sheet lists the various sizes of product ranging from dust to 2½-in. ring size that we require. Before deciding on this it will be necessary to consider the oversize from this screen and the following gyratory crusher. Since the largest ring size of product is to be 2½ in., all over this size as produced by the jaw as well as the 12-in. gyratory will have to be recrushed. From Table I we note that 14 tons of this oversize will be produced by the jaw crusher and 23 tons by the gyratory; thus the total feed to the final machine will be 37 tons per hour of material plus 2½-in. ring size. For this crusher we have decided if possible to use the latest of gyratory crushers made especially for fine crushing, and by referring to various catalogs we note that one size of this type of crusher, having about a 6-in. feed opening and 1⅝-in. discharge opening, which will produce a 2-in. ring size product, will have a capacity of about 45 tons per hour. This capacity, as well as the product, is satisfactory; therefore we will use for this purpose a 6-in. gyratory fine crusher. The product from this crusher

TABLE II—TO DETERMINE THE LENGTH OF EACH SECTION IN THE 60-IN. DIAMETER FINISHING SCREEN

Maximum Ring Size of Feed Inches	Ring Size of Product Inches	Total Tonnage Required	Listed Capacity per Foot of Length Tons	Theoretical Length of Sections Required Feet	Practical Length of Each Section Feet
1	½	17	2.6	6.5	7
4	1	21	3.1	6.8	8
4	1½	21	4.2	5.0	6
4	2	21	5.2	4.0	5
4	2½	20	6.0	3.8	5

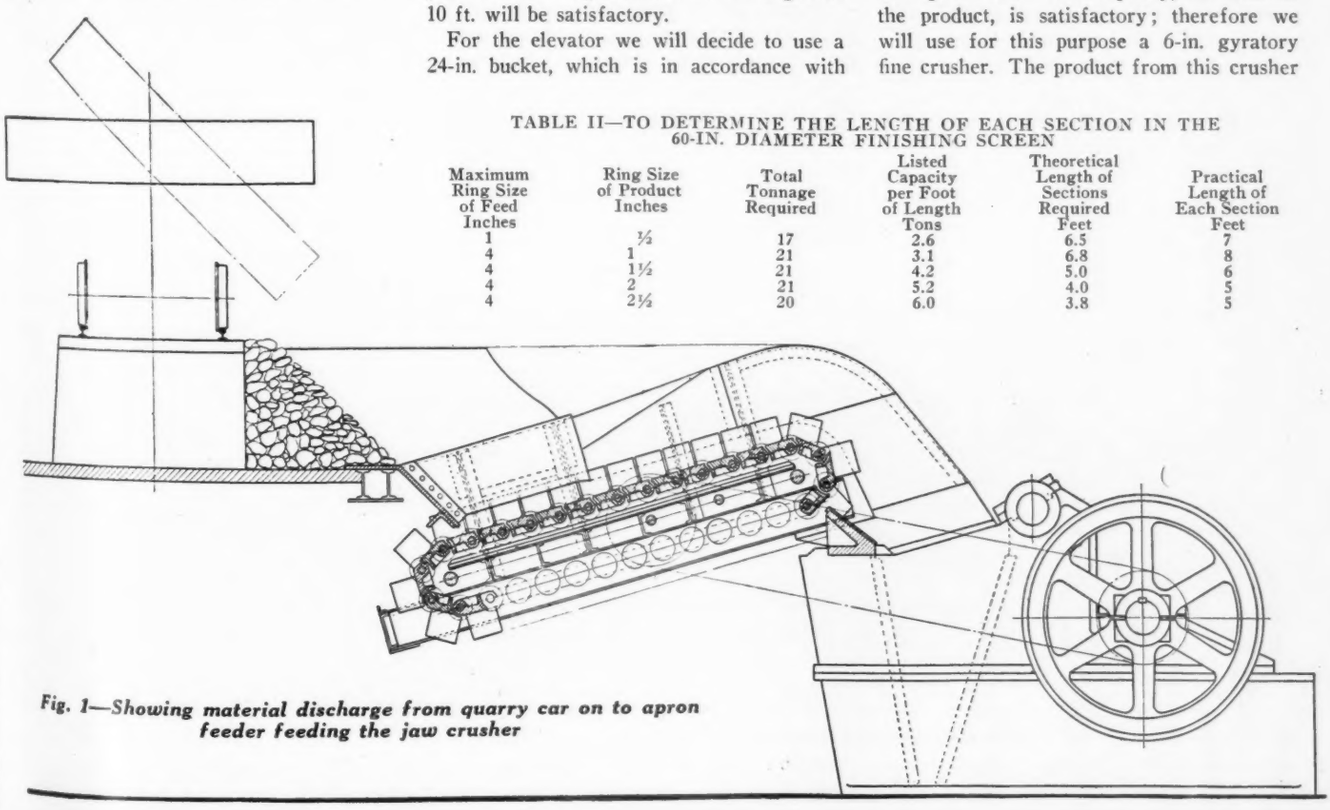


Fig. 1—Showing material discharge from quarry car on to apron feeder feeding the jaw crusher

is conveyed by a separate elevator—for which we will use a 13-in. bucket—back to the feed spout of the finishing screen. The product as produced is shown in Table I.

Finish Screening

With reference to the finishing screen the writer has purposely figured on quite a number of sizes of product to illustrate how it is possible with one rotary screen to do this work when a vibrating screen is used in connection. The modern type of shaking and vibrating screen has proven very satisfactory for the separation of material such as shown on the flow-sheet. By making the finest separation required on a single-deck vibrating screen and fitting the rotary screen with an outer jacket, it is practical to figure on an arrangement as illustrated.

TABLE III—LIST OF PRINCIPAL EQUIPMENT REQUIRED FOR CRUSHING PLANT ONLY

Item	Motor Required H.P.	R.P.M.
Apron feeder	10	900
42x40-in. jaw crusher	100	900
60-in.x10-ft. scalping screen	15	900
12-in. gyratory crusher	50	1200
24-in. bucket elevator, 60-ft. centers	20	900
60-in.x24-ft. finishing screen	30	900
6-in. gyratory crusher	40	1200
13-in. bucket elevator, 25-ft. centers	5	900
Vibrating or shaking screen	5	.....
Total h.p. required	275	

Table II shows the method by which the lengths of the various sections of the finishing screen were figured. In previous articles the writer has described in detail a simple method for figuring the requirements of rotary screens. A list of the principal items for this proposed plant together with the approximate sizes and speeds of the motors required is shown in Table III.

The arrangement of this proposed plant together with the size and type of equipment required gives us theoretically a well-balanced plant. The apron feeder for the jaw crusher makes possible a steady feed and each unit following has ample capacity for the requirements and still is not of excessive size, which would make the first cost and operating cost out of line with the other equipment.

Road Builders Ask Co-operation from Educational Institutions

PLANS were recently put under way for the celebration of Good Roads Week under the auspices of the American Road Builders' Association from January 10th to 16th, 1927. The National Education Association and the National government have been asked to assist in featuring the highways of the country in special exercises during that period.

President H. G. Shirley of the association has stressed the necessity of acquainting the school children of the nation with the location and economics of the 3,000,000,000 miles of roads estimated throughout the country. Mr. Shirley also announced the tentative plans for a national essay contest to be carried on among the students and for which several prizes will be awarded.

The association is also offering a free trip to the convention and road show to the engineer who writes the best article describing a method, material or equipment and its application to the economic construction, maintenance or operation of highways.

More Discretion to Be Exercised in Bonding Construction Contractors

ACTION expected to develop into a movement that will rid building operations of unnecessary costs and delays due to the presence of "wild-cat" contractors is now receiving the close attention of construction experts in Washington, D. C.

Surety bonds will be issued only to capable and financially responsible contractors under present plans. These plans, which call for a close questioning by surety officials of bidders who have secured awards and who seek bonds, are the result of a campaign carried on jointly by architects, engineers, state highway officials, surety companies' officers and representatives of the Associated General Contractors of America. Representatives of these several elements of the construction industry form the membership of the Joint Conference on Construction Practices, an organization founded three years ago to curtail activities of "fly-by-night" contractors whose operations upset the industry and force increased costs upon the building public.

While application of the plans to construction operations will at first be on a necessarily restricted scale, leading contractors and others who are interested in the movement see a strong possibility of a speedy broadening of scope.

At least one large company has already placed in the hands of its field agents questionnaires and other documents adopted by the Joint Conference on Surety Practices as a means of determining the abilities and financial standings of contractors who seek to undertake both public and private jobs.

Under existing conditions, field agents of surety companies, entering into intensive competition for the commissions to be derived some selling bonds, have long been providing surety for irresponsible builders, members of the conference declare. These incapable or dishonest builders have often defaulted their contracts, with the result that jobs have been delayed in completion and owners have sustained heavy losses through having their finances tied up for long periods in unproductive property. Also, it is claimed, the large number of defaults by irresponsible contractors has forced bonding companies to greatly increase the premium rates on bonds. These increases, amounting to virtually 1000% in 10 years, are passed on to the public and naturally produce higher building costs, according to a recent report made by a committee of the contractors' national organization.

Uses of Limestone Dust

A. T. GOLDBECK, director of the bureau of engineering of the National Crushed Stone Association, writes in the current *Crushed Stone Bulletin* of the uses of finely ground limestone. He mentions:

1. Filler in asphalt paving mixtures.
2. Filler in rubber.
3. Filler in paint.
4. Paper manufacture.
5. Filler in oil cloth.
6. Shoe polish.
7. Putty.
8. Tooth powder.
9. Roofing.
10. Glass manufacture.
11. Ceramic industry.
12. Dusting of mines.
13. Agriculture limestone.

For asphalt filler he finds there is a considerable market, perhaps 1,500,000 tons per year, although other materials than limestone dust are used. For filler 100% should pass 30-mesh and that 65 to 100% should pass 200-mesh.

Ground limestone to be used as fillers for paint, rubber and linoleum and for making tooth powder, shoe polish and putty should have certain other physical characteristics than fineness, according to the uses for which they are intended.

For glass making the chemical analysis of the limestone is most important. For the best glass the silica content should be less than 4% and the alumina less than 3%. Iron is especially objectionable and should be under 0.02%.

Ground limestone is used as an "extender" in paints and may possibly have other virtues than increasing the volume.

Agricultural limestone, Mr. Goldbeck rightly says, is a vast undeveloped market. The fineness required varies greatly in different parts of the country. It appears that magnesium limestone requires finer grinding, although it is equally effective with calcium when both are ground to 100-mesh.

Limestone for coal mine dusting must pass a 20-mesh screen and 50% must pass 200 mesh to meet Bureau of Mines specifications. This use is one that should be developed in every legitimate way by producers.

In conclusion the following is given as an average operating cost analysis for the fine grinding of limestone:

Depreciation— (cost plus installation)— $13,000—10-year life	$1,300.00
*Average interest at 6%— $\frac{11}{10} \times \$13{,}000.00 \times \frac{.06}{2}$	429.00
Repairs and maintenance	300.00
Total fixed charges per year	$2,029.00
Fixed charges per day—$2,029—280 days	$ 7.25
Fixed charges per hour—$7.25—9 hours	$ 0.81
Operating labor—1 man	.50
Cleaning—5 men 40 minutes per day divided by 9 hours × 50c per hour	.19
Power—75 hp. × $100 per hp. per year divided by 280 days divided by 9 hours	2.98
Total cost per hour	$ 4.48
Cost to Pulverize One Ton of Limestone	
99% through 150-mesh $4.48÷2½ tons	$ 1.79
99% through 200-mesh 4.48÷1¾ tons	2.56
99% through 300-mesh 4.48÷1 ton	4.48

Coarser grinding would necessarily be less expensive than shown above, and it must be remembered that other costs are involved before the material is finally marketed.

*Allowing for interest earned by depreciation reserve.

F. W. Schmidt

THE crushed-stone quarry industry has lost one of its pioneers—a man known and loved by his associates in the National Crushed Stone Association, of the welfare of which he was from the beginning a most devoted and zealous guardian.

Frederick Wilhelm Schmidt, long a resident of Morristown, N. J., died suddenly September 3, 1926, at his summer home, Millington, N. J.

Mr. Schmidt was born August 27, 1865, at Millington, N. J., the son of John Henry Schmidt and Margaret Ann (Nishwitz) Schmidt. Mr. Schmidt was of German descent. His great-grandfather, Peter Nishwitz, a Polish gentleman of rank and family, was a refuge during the times before the fall of Warsaw. His grandfather, Johann Peter Nishwitz, was an officer in Napoleon's body guard on the disastrous march from Moscow. In 1891 Mr. Schmidt married Effie Louise Taff, the daughter of Daniel Willis and Wilhelmina (Nishwitz) Taff. Mr. Schmidt and three children, Louise, the wife of Montagu Hankin, Frederick W. Schmidt, Jr., and John Henry Schmidt, survive.

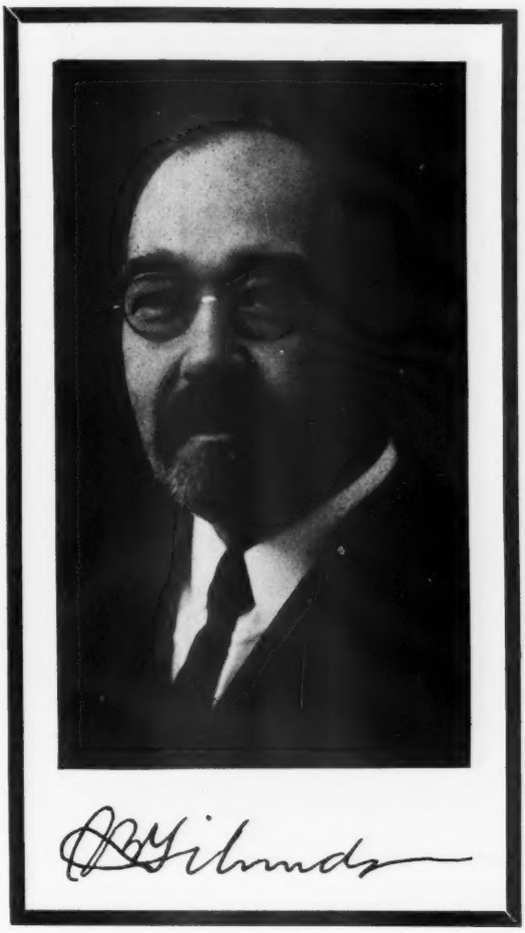
Mr. Schmidt received his education in the public schools of Madison, N. J. After graduation he returned to Millington and became associated with Frederick Nishwitz, his uncle, in the manufacture of farm machinery. In 1888, he moved to Morristown and became associated with his father, John H. Schmidt, in the carriage business.

In 1895, he became interested in the good roads movement then being agitated in New Jersey. He then organized the Morris County Crushed Stone Co. for the purpose of quarrying trap rock for road building purposes, and he soon became an authority on the construction of macadam roads. Mr. Schmidt's activities rapidly increased both in New Jersey and in New York, where he acquired large interests and developed quarries for the production of crushed stone. Mr. Schmidt formed, or controlled, directly or through the North Jersey Quarry Co., the Buffalo Crushed Stone Co. of Buffalo and the Suffern Stone Co., Inc., of Suffern in New York, the Consolidated Stone and Sand Co. of Great Notch, the Bound Brook Crushed Stone Co. at Bound Brook, the Paterson Crushed Stone Co. at Paterson, Commonwealth Quarry Co. at Summit and the Little Falls Sand and Gravel Co. at Little Falls, in New Jersey, and the Portland Sand and Gravel Co. at Portland, Penn. Three of these companies have quarries also at Morris Plains, Millington and Califon, New Jersey.

In addition to his extensive business interests, Mr. Schmidt was one of the founders of the New Jersey Manufacturers' Association, and always took an active interest in its affairs, having been a director since its organization.

Mr. Schmidt was interested in the political and civic affairs of Millington and Morristown, though he never aspired to office.

He was a director of and past president of the National Crushed Stone Association, a member of the Washington Association of New Jersey, the Rotary Club of Morristown, the American Concrete Institute, American Road Builders' Association, Atlantic States Shippers' Advisory Board, Engineers' Club of Trenton, Morristown Lodge No. 815, B. P. O. E., the Tapkaow Club, the Luncheon Club and the Spring Brook Country Club.



Mr. Schmidt was a most sincere friend and a genial and kindly comrade. It is doubtful if any one privileged to know him intimately could have failed to love, admire and respect him. He was beloved by his associates and employes, as only one can be loved who has an unfailing sense of fairness.

Recent Progress in Technology of Slate

RAPID PROGRESS has been made recently in developing new and improved processes for the mining and manufacture of slate, states the Bureau of Mines, Department of Commerce, following a survey of the industry. Such changes in technology are indicative of the present tendency to place the industry on a better basis both as regards processes and products. Roofing slate which was formerly manufactured in small independent "shanties" is now produced in many places in large mills provided with power saws, traveling cranes and other labor-saving devices. A pneumatic splitter has also been introduced to take the place of the ordinary chisel and mallet. A slate with lacquered surface in various colors and patterns has lately been placed on the market for sanitary uses, and heavy "architectural" roofing slates have come into greater prominence. Great progress has been made in studies of the physical and chemical properties of slates, the accumulated knowledge thus gained enabling the producers to direct each type of slates to its particular field, and thus constantly to provide more serviceable and dependable products.

Slate—the Sheltering Stone

Slate has been called "the sheltering stone" because one of its principal uses is for roofing, states Oliver Bowles, superintendent of the Non-Metallic Experiment Station of the Bureau of Mines, New Brunswick, N. J., in a report just published. Structures as humble in character as sheds and barns, those of imposing dimensions such as colleges, hospitals and churches, as well as all intermediate types of buildings, have found ample and enduring protection from the elements when properly roofed with this natural rock material, slate, which is peculiarly adapted for splitting into thin slabs. Other important uses are for electrical switchboards, school blackboards, and structural uses such as stair treads, floor tile and baseboards. The Bureau of Mines made a comprehensive study of the slate industry a few years ago and published Bulletin 218, "The Technology of Slate," in 1922, covering the results of these investigations. Since that time rapid progress has been made in developing new and improved processes of mining and manufacture of slate and slate products.

Interesting developments that have taken place within the past three or four years in the slate industry are described in Serial 2766, copies of which may be obtained by those interested on application to the Bureau of Mines, Department of Commerce, Washington, D. C.

Hints and Helps for Superintendents

A Pontoon with Excellent Features

THE pontoon shown in the picture is used by the Price Sand Co. in dredging the Arkansas river at Tulsa, Okla., and it has some unusual and very good features.

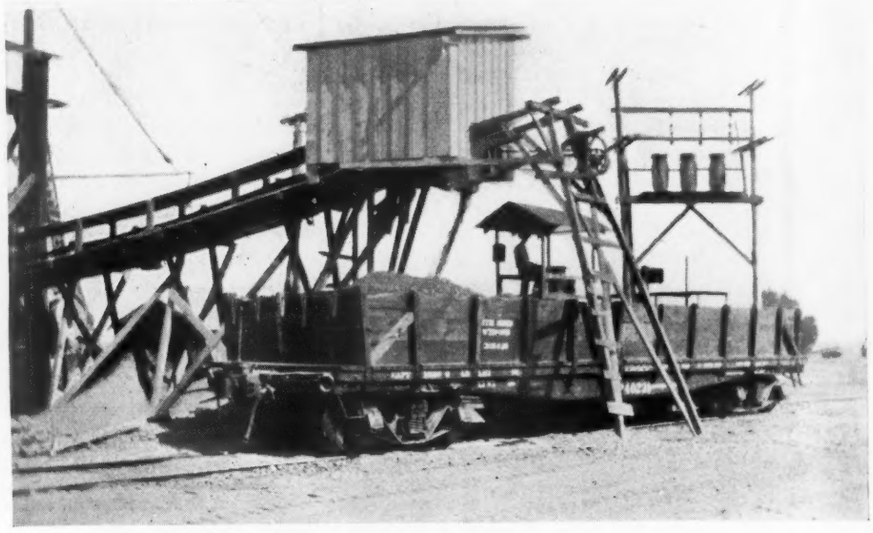
One of these is the shape of the pontoon itself. The deck is about 6x8 ft. and the bottom is about 2 ft. smaller each way so that the sides slant inwardly all around. A pontoon of this shape handles better in the current than one with square sides and is much more stable. It costs little, if any, more to build than a straight sided pontoon.

But the feature which is perhaps most worth copying is that of the uprights on the deck that hold the pipe. These uprights have a series of holes through which a round bar is placed so as to bring the pipe to just the required height. They take the place of the blocking and shimming that is usually placed under the pipes on pontoons.

The pipe is placed high enough above the deck so that it can be used for supporting the cable that brings the electric current to the motor on board the dredge. This does away with the frames that are usually found on pontoons to support the cable. In this case the cable is tied to the pipe with short pieces of rope or insulated wire.

It will be noted that there is no walkway between the pontoons. This is because the men are not permitted to go from the dredge to the land by way of the pipe line. They must use a boat. This is an excellent rule for safety as men have sometimes received serious shocks by grabbing the cable, going from the dredge to the shore, on dredges where this rule was not in force.

This type of pontoon has several advantages



Note covered platform from which loading of cars is controlled

Preventing Segregation in Loading Mixed Sizes

By FRANK B. MARKS
Gravel Producer, Newman, Calif.

WE load considerable road gravel from our plant, a mixture of fine and coarse sizes, and we have done considerable experimenting on how to control segregation. We have tried some ideas of our own and others which we got from ROCK PRODUCTS. But none of them seemed to work satisfactorily until we used the present system, which is our own idea.

We have a swinging spout hanging from the head of our loading conveyor which is run by an eccentric driven by a belt from the conveyor head pulley. This spout throws the material from one side of the car to the other, covering the full width.

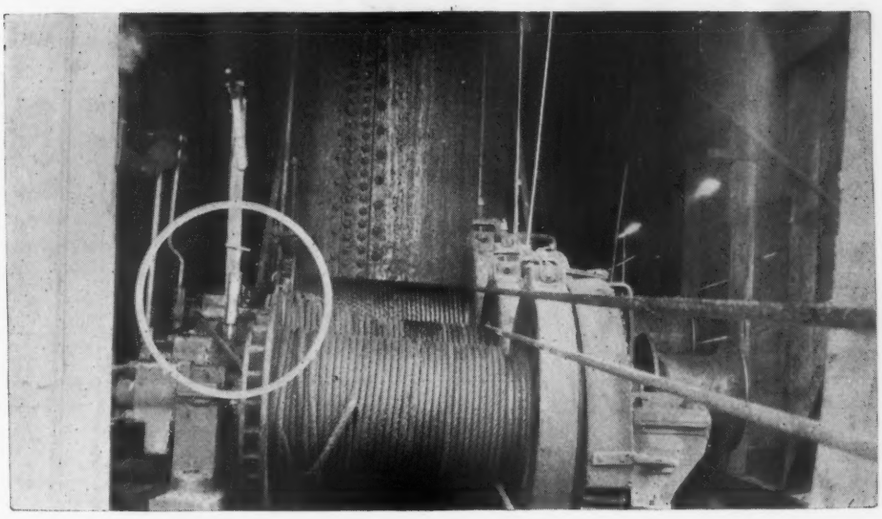
Then we have a single drum hoist located about 20 ft. past the loading point and just to the side of the track. Above this hoist we have a platform built high enough for the man that tends cars to be able to look into the cars. The hoist controls and the motor starter are extended to this platform. The hoist has 200 ft. of 5/8-in. cable on the drum and a large, heavy hook on the end

Swinging spout operated by eccentric

of it. There is a snatch block on the opposite side of the loading point.

In loading, the cars are pulled forward, putting in about a third of the carload and making the "dumps" about 5 ft. apart. Then the cable is put around the snatch block and car pulled back, stopping so as to put in a dump between each of the first dumps. These dumps are built up high enough so that the rock just starts to roll off the peaks. Then the car is pulled back once more, making dumps between these last dumps, which also smooths off the load at the same time.

With the swinging spout and the moving of the cars a good mixture can be made which will arrive at its destination unsegregated. One picture shows the swinging spout arrangement and the other a view of the car puller platform, the swinging spout and the car being loaded.



Oiling nipples are put on journals and other important bearings

Over Six Tons of Rock Per Pound of Explosive

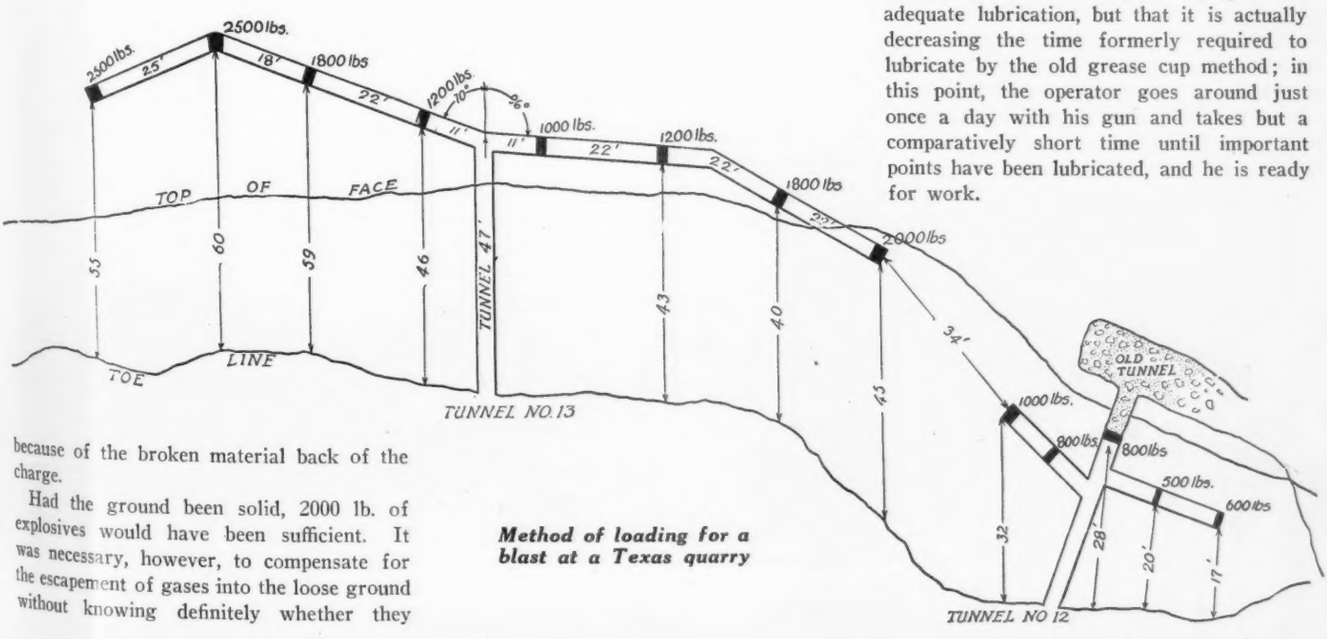
By R. H. SUMMER

THE Texas Trap Rock Corp. is quarrying from a large deposit of high-quality stone at Knippa, Texas, and marketing its product for commercial purposes. The highest point of the quarry extends 100 ft. above the floor. In working this trap rock deposit the coyote tunnel method of blasting is employed, for boring holes with well drills is impracticable because of the hardness of the rock and its columnar formation. In preparing for a large blast at the quarry last fall two tunnels were driven. The plan of the tunnels, which are numbered 13 and 12, respectively, and the distribution of the explosives charges, are shown in the accompanying sketch. Tunnel 12, the small one, was driven into a place where an old blast had been fired; and there was some question as to what action the explosives would take because of the broken material back of the charge.

Had the ground been solid, 2000 lb. of explosives would have been sufficient. It was necessary, however, to compensate for the escapement of gases into the loose ground without knowing definitely whether they would work up into the solid material above or not.

After studying the conditions it was decided that it would be better to place a charge heavy enough to move all of the burden above the broken ground, and to accept the chance of scattering the rock, rather than to risk not bringing the material down. Hence, this tunnel was loaded with 3700 lb. of explosives.

Altogether 17,700 lb. of du Pont 60% Straight and Durox were loaded into the pockets of the tunnels. The charges in both were connected by a double line of Cordeau and fired from the big tunnel side. The small tunnel shot was the first to break through on account of the lighter burden. After the blast, it was estimated that between 90,000 and 100,000 tons of broken rock were brought down. Including the back break, the total amount of broken material was approximately 110,000 tons.—*du Pont Magazine.*



Method of loading for a blast at a Texas quarry

Increased Lubrication Efficiency

IT IS NOT necessary to dwell at length upon the advantages to be had on high compression lubrication. This has been brought out at various times in ROCK PRODUCTS, but in various cases it may be put on machinery by the operators themselves.

The case in point is at the plant of the Riverside Sand and Gravel Co., Newton Lower Falls, Mass. This plant is one of the largest producers of sand and gravel in the Boston territory.

The company uses guyed derricks and clam-shell buckets to excavate all their material, which is deposited upon belt conveyors and brought to the screening plant. The hoist operating the derricks has all been coupled with the "Dot" system of high pressure lubrication in the hoist, nipples have been put on journals, and other strategic points, as is shown by the accompanying photograph. The company has found that this not only increases the life of the machinery by furnishing the proper and adequate lubrication, but that it is actually decreasing the time formerly required to lubricate by the old grease cup method; in this point, the operator goes around just once a day with his gun and takes but a comparatively short time until important points have been lubricated, and he is ready for work.

Largest Cement Mill on West Coast

Santa Cruz Portland Cement Company Produces Over 10,000 Barrels Per Day at Its Davenport, California, Plant

ONE of the largest cement manufacturing mills in the country is the Davenport, Calif., plant of the Santa Cruz Portland Cement Co. The capacity production is about 10,000 bbl. per day and this will be raised to 14,000 bbl. when the additional equipment now being installed is all in place. The mill uses the dry process and there are 18 kilns 7½x125 ft. long, oil fired. Electric power is used throughout, the connected load being about 12,000 hp.

The mill site at Davenport is near the northern terminus of the marine terrace, which borders the ocean northwesterly from Santa Cruz for 15 miles. The plant is about one-half mile north of San Vincente canyon and 13 miles from Santa Cruz. A branch line of the Canadian Pacific Railroad from Santa Cruz serves it.

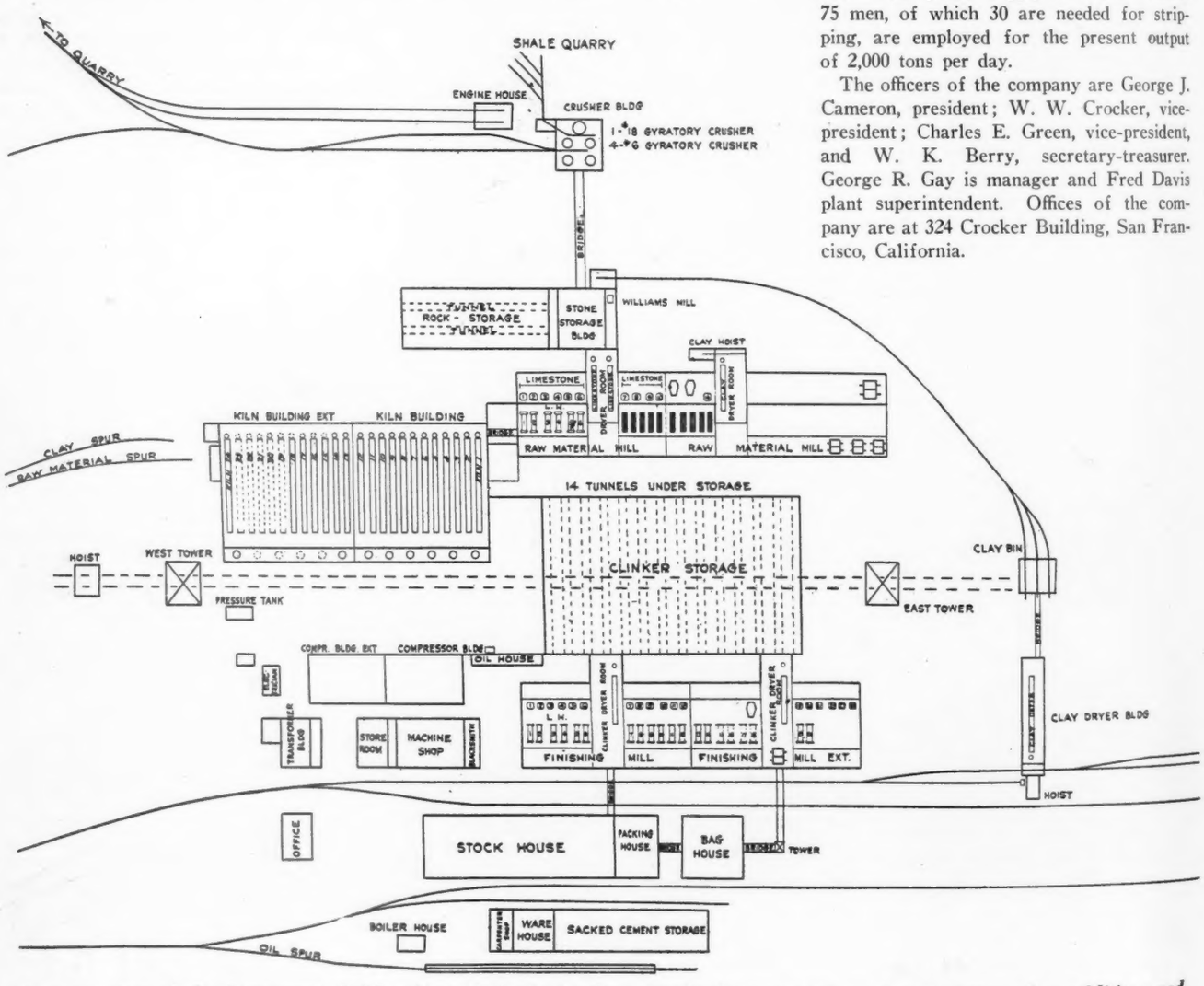
Limestone and a considerable portion of the clay used come from the company's quarry located three miles up the canyon. Additional clay is mined at Glendale and shipped to storage at the plant. Gypsum used comes from Nevada.

The plant has been in continuous operation, although not always up to capacity, since 1907, when the first shipment was made. Additions to and changes have been made in equipment and in operation methods both at the mill and quarry and some radical changes are even now under way. The accompanying plan shows the general layout of the mill and equipment as it will appear when alterations are completed. Several details such as the conveyor distributing system with its automatic weighing and mixture control arrangement are not indicated. The chief changes that have been made are the replacement of the high-pressure system by a low-pressure oil-burning system and the addition of Hum-mer screens, rolls and Hardinge mills, which in part replaced tube and ball mills.

The most important change at the quarry has been the abandonment of the original open quarry worked in a single bench with steam shovel loading and the substitution of a new quarrying method designed and put in operation by Robert A. Kinzie, mining engineer of San Francisco. The plan of working consists briefly of a combination of glory holes, transfer raises, bulldozing chambers, chute loading and adit transportation. Since in operation over 500,000 tons of limestone have been removed and carried to the cement plant at a cost considerably less than formerly.

The deposit contains a high calcium stone, homogeneous, close grained, wite to gray in color and is extended over a width of 1200 ft. for about three-quarters of a mile. The area was diamond-drilled before adoption of the glory hole method and its tonnage found to be sufficient to supply the company for a long period of operation. Stripping is carried on far enough in advance to provide about four years' supply of stone. About 75 men, of which 30 are needed for stripping, are employed for the present output of 2,000 tons per day.

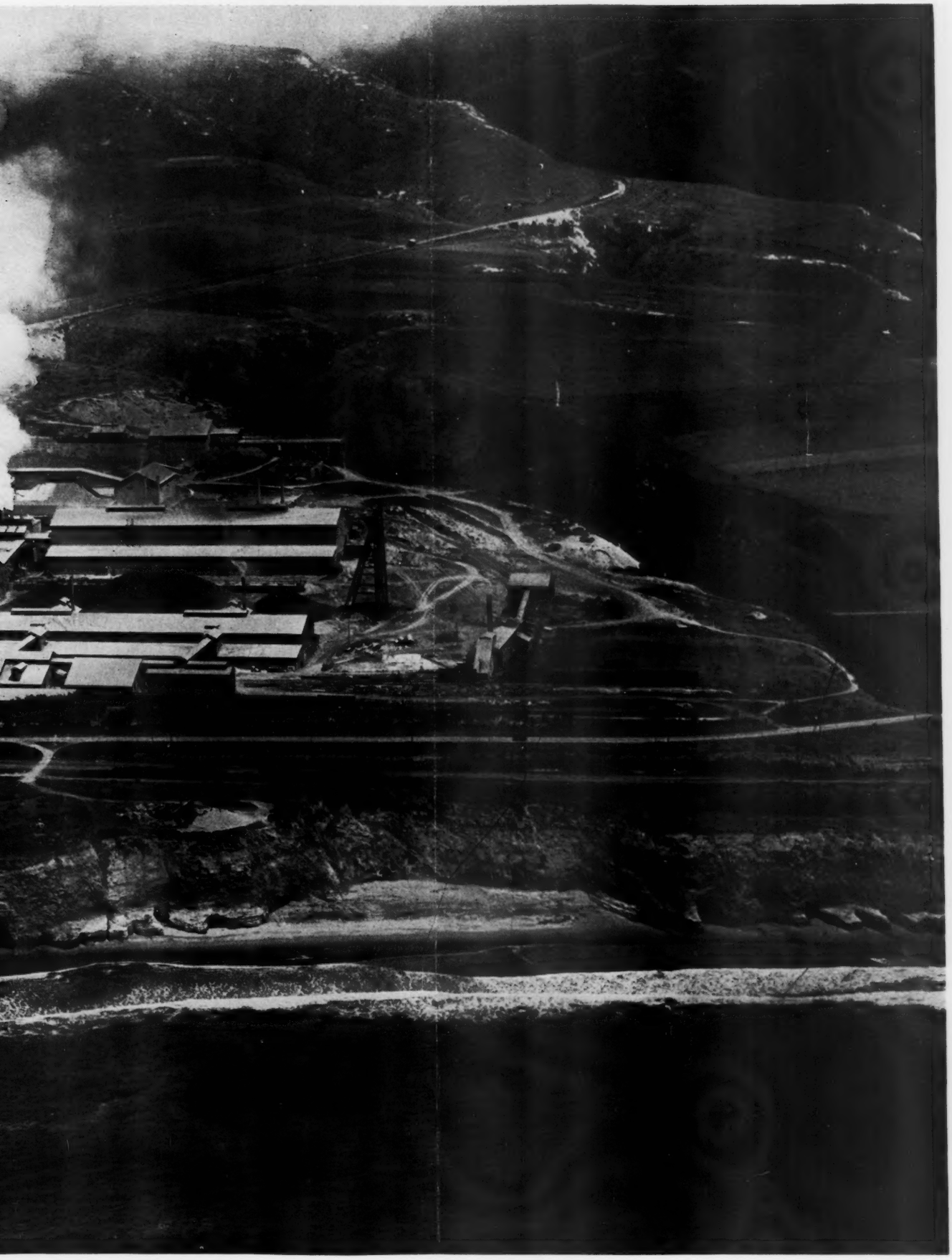
The officers of the company are George J. Cameron, president; W. W. Crocker, vice-president; Charles E. Green, vice-president, and W. K. Berry, secretary-treasurer. George R. Gay is manager and Fred Davis plant superintendent. Offices of the company are at 324 Crocker Building, San Francisco, California.



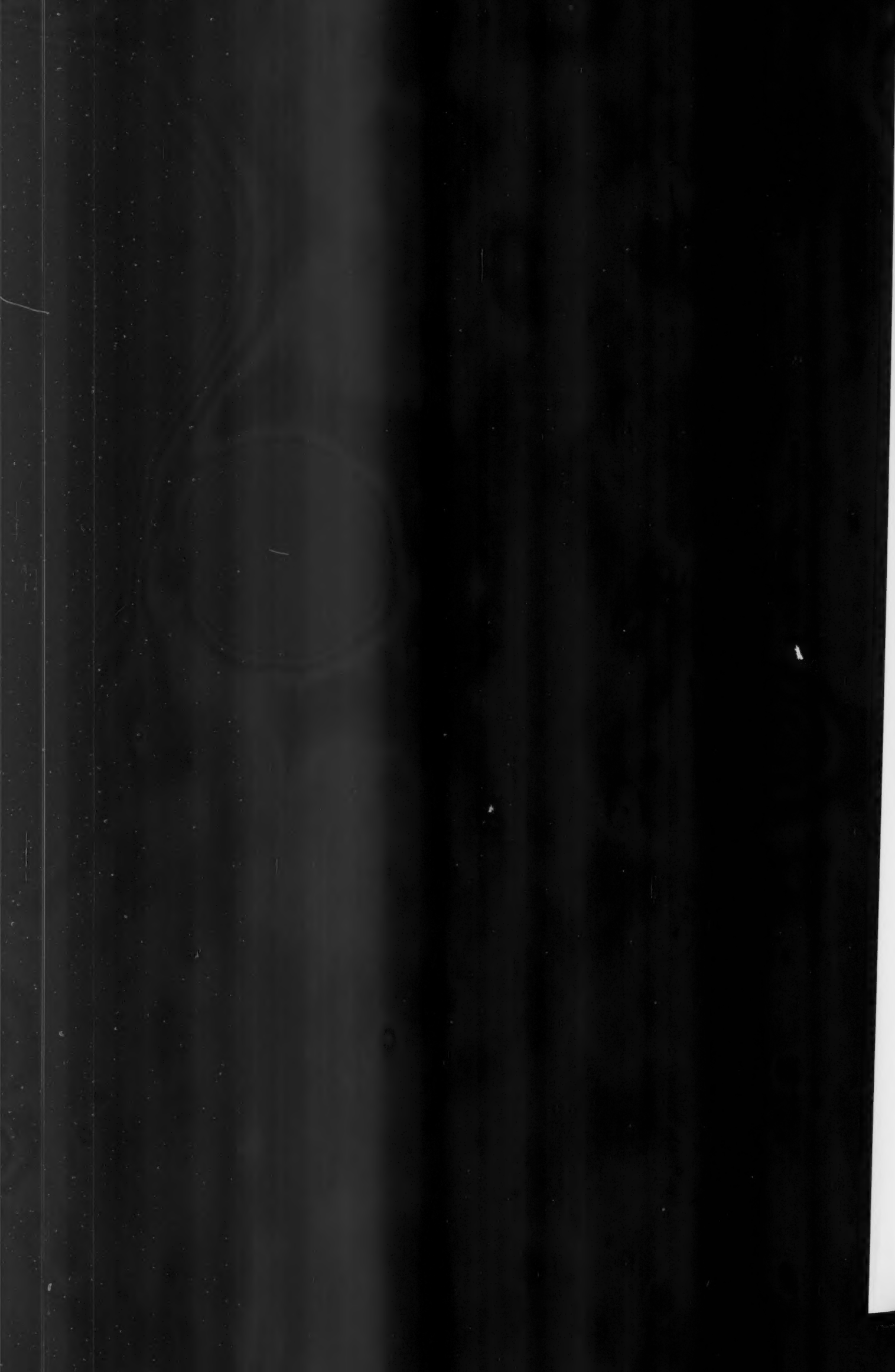
General plan of the Davenport, Calif., plant of the Santa Cruz Portland Cement Co. as it will appear after additions and changes in equipment have been made which will increase the capacity to 14,000 bbl. per day

Aeroplane view of the plant of the Santa Cruz Portland Cement Co., Davenport, Calif., the

f the plant of the Santa Cruz Portland Cement Co., Davenport, Calif., the largest p



largest plant on the West Coast and one of the largest in the world



Sand-Lime Brick Production and Shipments in August

ACCORDING to statistics received from 14 sand-lime brick plants located in the United States and Canada, production of sand-lime brick for August was below that of the previous month. Shipments remained about the same and while stocks on hand at the end of August are slightly below those of the previous month, it is probable that they are really above, for two plants gave out no data on them. Unfilled orders, despite two plants not reporting, are well above the amounts reported at the end of July. The plants reporting constitute about one-third of the number operating in the United States and Canada, but are the largest producers and their output is about one-half of the total production in the two countries. The following table gives comparative statistics for July and August:

Sand-Lime Brick Statistics for July and August, 1926

	July	August*
Production	20,819,000	16,116,000
Shipments (rail)	5,649,000	6,740,000
Shipments (truck)	10,996,000	9,473,000
Stocks	7,613,000	†7,251,000
Unfilled orders	18,526,000	†21,450,000

*Includes statistics for one more plant not reporting in July.
†Incomplete (two plants not furnishing data on stocks and unfilled orders).

The following are average prices of sand-lime brick for August:

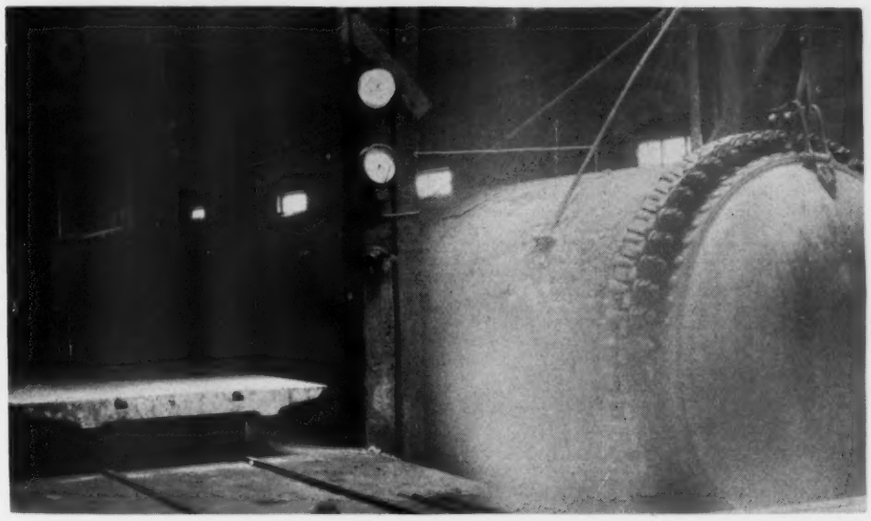
	Plant price.	Delivered
Hartford, Conn.	$14.00	$18.00
Milwaukee, Wis.	10.50	13.00
Minneapolis, Minn.	10.00	†12.75
Detroit, Mich.	13.60	16.20
Michigan City, Ind.	11.00	.....
Toronto, Ont.	13.10	15.60
Woburn, Mass.	13.98	.....
Dayton, Ohio	12.50	15.00
Grand Rapids, Mich.	12.00	14.00
Lakeland, Fla.	10.50	14.00
Menominee, Mich.	11.00@12.00	14.00
Pontiac, Mich.	13.50	17.00
Washington, D. C.	13.50	16.00

†C.L., L.C.L., $16.50.

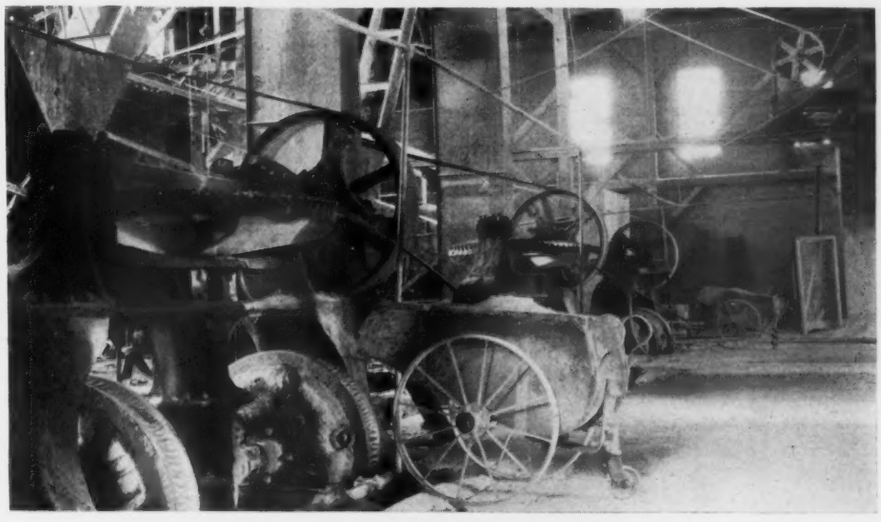
The companies in nearly all cases shipped nearly their entire production and in several instances, particularly in the east, the reports indicated no stocks on hand with a large total of unfilled orders. This is all the more interesting, for it is generally reported that there is a large cargo of German sand-lime brick that was delayed in shipment being offered in eastern markets. The manufacturers' optimistic report would indicate that the influence of foreign brick is almost negligible. Prices were steady and if anything showed a slight decrease.

Accident at Winchester Brick Company Plant

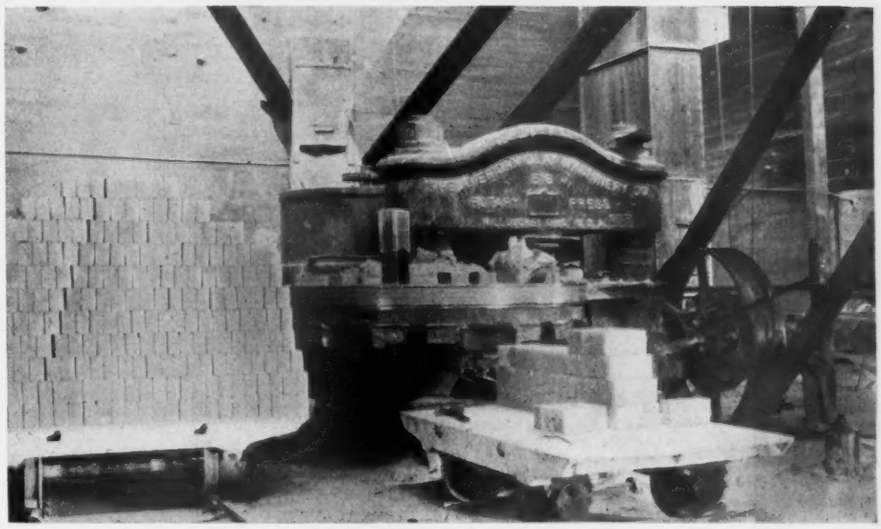
Unfamiliarity with a new style of kiln door recently installed at the plant of the Winchester Brick Co., Winchester, Mass., resulted in an accident a short time ago. Six employes started to open the kiln door while there was still about 25 lb. pressure within. The pressure jumped it open and the door dropped on one of the men and the steam burnt all of them. The kiln has a type of door that fastens with a series of lugs all around in contrast to the others in use on the kilns which are fastened with bolts and nuts. All the injured were removed to a nearby hospital.



One of the cylinder kilns at the Winchester Brick Co., Winchester, Mass., showing the more common method of fastening the end—This is not the kiln on which the accident occurred



Portion of the press room at the Winchester plant



Rotary brick press and truck of green brick at Winchester plant

Financial News and Comment

RECENT QUOTATIONS ON SECURITIES IN ROCK PRODUCTS CORPORATIONS

(These are the most recent quotations available at this printing. Revisions, corrections and supplemental information will be welcomed by the editor.)

Stock	Date	Par	Price bid	Price asked	Dividend rate
Alpha Portland Cement Co. (common)[2] new stock	Sept. 14	No par	44	45½	1½% quar. Apr. 3
Alpha Portland Cement Co. (preferred)[2]	Sept. 14	100	115	.....	1¾% quar. Mar. 1
Arundel Corporation (sand and gravel—new stock)	Sept. 14	No par	35	36¾	45c qu., 15c ext. July 1
Atlantic Gypsum Products Corp. (1st 6's carrying 10 sh. com.)[10]	Sept. 15	.....	105	107	
Atlas Portland Cement Co. (common)[2]	Sept. 14	No par	44	45½	50c quar. Sept. 1
Atlas Portland Cement Co. (preferred)	.....	100	.....	.....	2% quar. Oct. 1
Atlas Portland Cement Co. (preferred)[2]	Sept. 14	33⅓	43	46	2% quar. July 1
Beaver Portland Cement Co. (1st Mort. 7's)[8]	July 29	100	100	100	
Bessemer Limestone and Cement Co. (common)[4]	Sept. 13	100	130	135	1½% quar. June 30
Bessemer Limestone and Cement Co. (preferred)[4]	Sept. 13	100	107	109	1¾% quar. June 30
Bessemer Limestone and Cement Co. (convertible 8% notes)[4]	Sept. 13	.....	114½	120	8% annual
Boston Sand and Gravel Co. (common)[16]	Sept. 11	100	60	63	2% quar. July 1
Boston Sand and Gravel Co. (preferred)[16]	Sept. 11	.....	.....	75	1¾% quar. July 1
Boston Sand and Gravel Co. (1st preferred)[10]	Sept. 11	.....	.....	83	2% quar. July 1
Canada Cement Co., Ltd. (common)	Sept. 15	100	109	110½	1½% quar. July 16
Canada Cement Co., Ltd. (preferred)[11]	Sept. 10	100	114	115	1¾% quar. Aug. 16
Canada Cement Co., Ltd. (1st 6's, 1929)[11]	Sept. 10	.....	102¼	103	3% semi-annual A&O
Canada Crushed Stone Corp., Ltd. (6½s, 1944)[11]	Sept. 10	100	92	96	
Charles Warner Co. (lime, crushed stone, sand and gravel)	Sept. 13	No par	23	25	50c quar. July 12
Charles Warner Co. (preferred)	Sept. 13	100	101	103	1¾% quar. July 22
Charles Warner Co. (lime, crushed stone, sand and gravel) 7s, 1929[16]	Sept. 10	100	102½	104	
Cleveland Stone Co. (new stock)	Sept. 14	.....	60	67	$1.50 qu. Sept. 1
Connecticut Quarries Co. (1st Mortgage 7% bonds)[17]	Sept. 10	100	104	.....	
Consolidated Cement Corp. (1st Mort., 6½s, series A)[24]	Sept. 13	.....	97	99	
Consolidated Cement Corp. (5 yr. 6½% gold notes)[24]	Sept. 15	100	96	100	
Consumers Rock and Gravel Co. (1st Mort. 7s)[16]	Sept. 7	100	99	101	
Dexter Portland Cement Co. (6% serial bonds, 1935)[22]	Sept. 15	.....	99	.....	
Dolese and Shepard Co. (crushed stone)[7]	Sept. 15	50	91	93	$1.50 quar. July 1, $1 ex. July 1
Egyptian Portland Cement Co. (7% pfd. with com. stock purchase warrants)[21]	Sept. 10	.....	95	100	1¾% quar. July 1
Egyptian Portland Cement Co. (common)[21]	Sept. 10	.....	16	18	40c quar. July 1
Egyptian Portland Cement Co. (warrants)[21]	Sept. 10	.....	10	15	
Giant Portland Cement Co. (common)[2]	Sept. 14	50	59	62	
Giant Portland Cement Co. (preferred)[25]	Sept. 14	50	52	55½	3½% s.-a. June 15
Ideal Cement Co. (common)	Sept. 15	No par	68	70	1¾% quar. July 1
Ideal Cement Co. (preferred)[6]	Sept. 11	100	106½	109½	$1 quar. July 1
International Cement Corporation (common)	Sept. 15	No par	53⅞	55½	$1 quar. Sept. 30
International Cement Corporation (preferred)[2]	Sept. 13	100	104½	104½	1¾% quar. Sept. 30
International Portland Cement Co., Ltd. (preferred)	Mar. 1	.....	30	45	
Kelley Island Lime and Transport Co.	Sept. 14	100	125	130	$2 quar. July 1
Lawrence Portland Cement Co.[2]	Sept. 13	100	100	110	2% quar.
Lehigh Portland Cement Co.[6]	Sept. 14	50	85½	89	1½% quar.
Lyman Richey Sand and Gravel Co. (1st Mort. 6s, 1927 to 1931)[13]	Sept. 13	100	99	100	
Lyman Richey Sand and Gravel Co. (1st Mort. 6s, 1931 to 1935)[13]	Sept. 13	100	97	100	
Marblehead Lime Co. (1st Mort. 7's)[14]	Sept. 13	100	104	106	
Marblehead Lime Co. (5½% notes)[14]	Sept. 13	100	98	100	
Michigan Limestone and Chemical Co. (common)[6]	Sept. 14	.....	25½	.....	
Michigan Limestone and Chemical Co. (preferred)[6]	Sept. 14	.....	23½	25½	1¾% quar. July 15
Missouri Portland Cement Co.	Sept. 15	25	55	56	50c quar. Aug. 1, 25c ex. Aug. 1
Monolith Portland Cement Co. (common)[9]	Sept. 7	.....	11	11½	
Monolith Portland Cement Co. (units)[9]	Sept. 7	.....	27	28	
Monolith Portland Cement Co. (preferred)[9]	Sept. 7	.....	8	8¼	
Nazareth Cement Co.[26]	Sept. 14	No par	40	42	75c quar. Apr. 1
Newaygo Portland Cement Co.[1]	Sept. 13	.....	115	130	
New England Lime Co. (Series A, preferred)[14]	Sept. 13	100	92	96	
New England Lime Co. (Series B, preferred)[23]	Sept. 10	100	92	96	
New England Lime Co. (V.T.C.)[22]	Sept. 10	.....	35	38	
New England Lime Co. (6s, 1935)[14]	Sept. 13	100	99	101	
North American Cement Corp. 6½s 1940 (with warrants)	Sept. 15	100	96⅞	96⅞	
North American Cement Corp. (units of 1 sh. pfd. plus ½ sh. common)[19]	Aug. 14	.....	94	99	2 mo. period at rate of 7%
North American Cement Corp. (common)[19]	Sept. 14	.....	20	22	
North American Cement Corp. (preferred)	Dec. 31	.....	.....	.....	1.75 quar. Aug. 1
North Shore Material Co. (1st Mort. 6's)[15]	Sept. 15	100	99	100	
Pacific Portland Cement Co., Consolidated[6]	Sept. 7	100	67	70	½% mo.
Pacific Portland Cement Co., Consolidated (secured serial gold notes)[5]	Sept. 7	100	97¾	98½	3% semi-annual Oct. 15
Peerless Portland Cement Co.[1]	Sept. 13	10	6⅝	7¼	
Petoskey Portland Cement Co.[1]	Sept. 15	10	9	9½	1½% quar.
Pittsfield Lime and Stone Co. (2 sh. pfd. and 1 com.)[10]	Sept. 11	.....	.....	225	
Rockland and Rockport Lime Corp. (1st preferred)[10]	Sept. 11	100	105	105	3½% semi-annual Aug. 2
Rockland and Rockport Lime Corp. (2nd preferred)[10]	Sept. 11	100	.....	.....	3% semi-annual Aug. 2
Rockland and Rockport Lime Corp. (common)[10]	Sept. 11	No par	50	50	1½% quar. Nov. 2
Sandusky Cement Co. (common)[1]	Sept. 14	100	118	130	$2 quar. Apr. 1
Santa Cruz Portland Cement Co. (bonds)[5]	Sept. 7	.....	105⅞	.....	6% annual
Santa Cruz Portland Cement Co. (common)[5]	Sept. 7	50	80	82	$1 quar. $1 ex. Dec. 24
Superior Portland Cement, Inc. (Class A)[20]	Sept. 11	.....	41	41½	
Superior Portland Cement, Inc. (Class B)[20]	Sept. 11	.....	20½	21½	
United Fuel and Supply Co. (sand and gravel) 1st Mort. 6s[27]	July 16	100	98	100	
United Fuel and Supply Co. (sand and gravel) 6% gold notes[27]	July 16	100	96	99	
United States Gypsum Co. (common)	Sept. 15	20	152	152½	2% quar., $1 ex. Sept. 1
United States Gypsum Co. (preferred)	Sept. 15	100	118	119	1¾% quar. Sept. 30
Universal Gypsum Co. (common)[3]	Sept. 15	No par	.....	14	
Universal Gypsum V.T.C.[3]	Sept. 14	No par	14¼	15	
Universal Gypsum Co. (preferred)[3]	Sept. 15	.....	70	73	1¾% quar. Sept. 15
Universal Gypsum Co. (1st Mortgage 7% bonds)[3]	Sept. 14	.....	99	(at 6½%)	
Union Rock Co. (7% serial gold bonds)[18]	Sept. 7	100	99	101½	
Wisconsin Lime and Cement Co. (1st Mort. 6s, 1940)[15]	Sept. 15	100	98½	100	
Wolverine Portland Cement Co.	Sept. 15	10	6	6	2% quar. Aug. 15

[1]Quotations by Watling, Lerchen & Co., Detroit, Mich. [2]Quotations by Bristol & Willett, New York. [3]Quotations by True, Webber & Co., Chicago. [4]Quotations by Butler, Beading & Co., Youngstown, Ohio. [5]Quotations by Freeman, Smith & Camp Co., San Francisco, Calif. [6]Quotations by Frederic H. Hatch & Co., New York. [7]Quotations by F. M. Zeiler & Co., Chicago, Ill. [8]Quotations by Ralph Schneeloch Co., Portland, Ore. [9]Quotations by A. E. White Co., San Francisco, Calif. [10]Quotations by Lee, Higginson & Co., Boston and Chicago. [11]Nesbitt, Thomson & Co., Montreal, Canada. [12]E. B. Merritt & Co., Inc., Bridgeport, Conn. [13]Peters Trust Co., Omaha, Neb. [14]Second Ward Securities Co., Milwaukee, Wis. [15]Central Trust Co. of Illinois, Chicago. [16]J. S. Wilson Jr. Co., Baltimore, Md. [17]Chas. W. Scranton & Co., New Haven, Conn. [18]Dean, Witter & Co., Los Angeles, Calif. [19]Hemphill, Noyes & Co., New York. [20]Quotations by Bond & Goodwin & Tucker, Inc., San Francisco. [21]Baker, Simonds & Co., Inc., New York. [22]William C. Simons, Inc., Springfield, Mass. [23]Blair & Co., New York and Chicago. [24]A. B. Leach and Co., Inc., Chicago. [25] A. C. Richards & Co., Philadelphia, Penn. [26]Hincks Bros. & Co., Bridgeport, Conn. [27]J. G. White and Co., New York.

QUOTATIONS ON INACTIVE ROCK PRODUCTS CORPORATION SECURITIES ON PAGE 68

Editorial Comment

Reasons for Increasing Building

The Bureau of Labor in a recent report says that: "Assuming that the buildings in 1914 cared for the needs of the population at that time, then the per cent of population increase since that time would be the normal per cent of necessary construction." This seems to be a commonly held opinion. As an example, the remarks of George E. McIlwain at the Atlanta convention of the National Sand and Gravel Association might be quoted. He believed that we were overbuilt and that construction from the 1925 record of $6,620,000,000 would drop in 1926 to $5,000,000,000, whereas present indications are that it will come nearer to $7,000,000,000.

We believe that those who assume that building is wholly dependent on population increase fail to take into account some very important factors. These are: Shifts of population, the effect of new inventions, the need of better facilities for doing business and the great advance in the standards of living. Any one of these would still call for a great deal of construction if the population of the country remained stationary.

There are three shifts of population going on today in the United States. There is an expansion of population, and to some extent of industries, from the north to the south, principally noted in the textile and paper industries; a steady inflow to manufacturing centers whereby such towns as Flint, Mich., and Canton, Ohio, have gained enormously in both population and building, and a decided movement from the central portions of cities to the suburbs, have been made possible by better transportation. For this last mentioned reason great areas around Chicago and New York have been built over in the past five years.

The effect of new inventions can be best shown by considering how the automobile has promoted not only the construction of highways but many buildings such as filling stations and garages—not to mention country homes.

The need for better facilities for doing business has been fairly forced upon us by increased consumption. Everyone knows that with 7% of the world's population we now consume about 40% of the world's production, and consumption is constantly increasing. Added production naturally demands larger and better buildings for manufacturing, handling and warehousing of goods.

And the change in standards of living has perhaps been as potent a factor as any in increasing building. It may be that "the needs of the population were adequately supplied" in 1914 according to the standards of 1914, but the standards of 1926 have advanced in buildings as in other things. And we can afford to build to gratify our more ambitious requirements, for our creation of new wealth in 1925 was $70,000,000,000, which is $10,000,000,000 more than we have created in any other one year in our national history.

Foreign Cement Competition

The imports of portland cement for the first six months of 1926 were 1,648,371 bbl. For the corresponding period of 1925 they were 952,966 bbl. The increase is almost 75%, using the 1925 imports as a base. It is quite evident that the importation of portland cement is on the increase. The yearly importations also show this. In 1924 there were imported 2,010,936 bbl. and in 1925, 3,655,317 bbl.

Considering the cement production of the country as a whole the competition of foreign cement does not appear serious. The total imports in 1925 were only 2.3% of the domestic production. But the competition of foreign cements is not spread over the industry. It is localized and its effect is felt almost entirely in coast cities and towns. For example, in May of this year 72,079 bbl. of imported cement were received in Massachusetts and 362,878 bbl. of domestic cement. Imported cement was therefore 20% of the domestic receipts. As another and more striking example, it is frankly stated that the competition of foreign cement was one of the reasons for the closing of a plant on the Pacific coast during the months of July and August.

The loss of their regular markets on the coasts, of course, drives manufacturers into other markets already being adequately served, or to a shut-down, as in the case mentioned. In shutting down, that manufacturer is really doing a patriotic thing in protecting the home industry from greater demoralization. In choosing the lesser of two evils, it may look like a too ready admission of defeat, but if the policy were generally followed by the cement manufacturers affected, it undoubtedly would prove the best for the industry as a whole, as well as be the best possible argument for a general protective tariff against European dumping of cement. Only a small part of the cement now imported has to pay a tariff.

Edwin C. Eckel, who knows the portland cement industry on both sides of the Atlantic, has investigated the competition of foreign cement and takes a rather hopeless view of the case. He finds that the foreign manufacturer has these advantages in his favor: Cheap inland water transportation, cheap ocean transportation, cheaper labor and cheaper overhead (except for taxes). His belief is that American cement manufacturers will be forced to meet foreign competition by building plants in foreign countries to obtain the same advantages.

QUOTATIONS OF INACTIVE ROCK PRODUCTS SECURITIES

Stock	Date	Par	Price bid	Price asked	Dividend rate
Coplay Cement Mfg. Co. (common) (4)	Dec. 16	.....	12½	.....	
Coplay Cement Mfg. Co. (preferred) (1)	Dec. 30	.....	70	.....	
Eastern Brick Corp. 7% cu. pfd.) (1)	Dec. 9	10	40c	.....	
Eastern Brick Corp. (sand lime brick) (common) (1)	Dec. 9	10	40c	.....	
Edison Portland Cement Co. (common)4	Sept. 11	50	20c	.....	
Edison Portland Cement Co. (preferred)	Nov. 3	50	17½c(x)	.....	
Iroquois Sand & Gravel Co., Ltd. (2 sh. com. and 3 sh. pfd.) (1)	Mar. 17	.....	$12 for the lot	.....	
Lime and Stone Products Co. (1100 sh. pfd., $10 par and 700 sh. com., $10 par)	Feb. 10	.....	$66 for the lot	.....	
Missouri Portland Cement Co. (serial bonds)	Dec. 31	.....	104¾	104¾	3¼ % semi-annua.
Olympic Portland Cement Co. (g)	Oct. 13	.....	.....	£1⅝	
Phosphate Mining Co. (1)	Nov. 25	.....	1@5	.....	
River Feldspar and Milling Co. (50 sh. com. and 50 sh. pfd.) (1)	June 23	.....	$200 for the lot		
Rockport Granite Co. (1st 6's, 1934)2	Aug. 31	.....	90	.....	
Simbroco Stone Co. (pfd.)	Dec. 12	.....	.....	.....	$2 Jan. 1
Vermont Milling Products Co. (slate granules) 5 sh. pfd. and 1 sh. com. (3)	Dec. 30	.....	$1 for the lot	.....	
Wabash Portland Cement Co.1	Aug. 3	50	60	100	
Winchester Brick Co. (preferred) (sand lime brick) (5)	Dec. 16	.....	10c	.....	

(g) Neidecker and Co., Ltd., London, England. (1) Price obtained at auction by Adrian H. Muller & Sons, New York. (2) Price obtained at auction by R. L. Day and Co., Boston. (3) Price obtained at auction by Weilepp-Bruton and Co., Baltimore, Md. (4) Price obtained at auction by Barnes and Lofland, Philadelphia, Pa. (5) Price obtained at auction for lot of 50 shares by R. L. Day and Co., Boston, Mass. (x) Price obtained at auction by Barnes and Lofland, Philadelphia, on November 3, 1925.

National Lime and Stone Bonds Offered

KUECHLE & CO., Milwaukee, Wis., are offering at 100 and interest $300,000 1st (closed) mtge. 6½% sinking fund gold bonds of the National Lime and Stone Co., Carey, Ohio.

Dated July 7, 1926; due July 1, 1941. Interest payable J. & J. Denom. $1,000, $500 and $100. Redeemable all or part upon 60 days' notice on any interest date at par and interest plus a premium of 2%. Principal and interest payable at Commerce Guardian Trust & Savings Bank, trustee, Toledo, without deduction for normal Federal income tax not to exceed 2%.

The following data and from letter of E. Claud Edwards, president of the company:

Company.—Incorp. March 17, 1903 in Ohio. Is engaged principally in the manufacture and sale of hydrated lime, although the company also produces agricultural, lump and glass lime. It is one of the large manufacturers in this line in the United States. Its product in 1925 was sold to users located in 25 out out of 48 states of the Union.

Security.—Secured by a direct closed first mortgage on all fixed assets of the company, specifically including land, buildings, machinery and equipment comprising the company's plant located in Carey, Ohio. The tract of land comprises approximately 130 acres.

Earings.—Average annual net earnings available for payment of interest charges for the period of 2½ years ended June 30, 1926, after deducting depreciation, depletion and Federal taxes were $83,829, or over 4¼ times the maximum bond interest requirements on these bonds. During this period the company made improvements and repairs to its plants in excess of $267,000, which amount was deducted before arriving at the average net earnings here shown.

Purpose.—Proceeds will be used to refund bonds of an issue now outstanding, to reimburse the company for capital expenditures already made in connection with new additions to plant and other corporate purposes.

Capital Stock.—1st pref. 7% cumulative, $60,000; second pref. 7% cumulative, $100,000; common (no par value), to be issued 1,000 shares in exchange for stock having a par value of $100 per share.

Arundel Earnings

THE net profit accruing from the operations of the Arundel Corp., Baltimore, Md., for the seven months ended July 31, 1926 was $1,135,942 as compared with $1,328,886 for a like period in 1925.

Universal Gypsum and Lime Merger Financing

AN offering of $2,000,000 first mortgage 6% bonds with stock option warrants is expected to be made soon in connection with the new financing of the merger of the Universal Gypsum Co. and the Palmer Lime and Cement Co. The company, which is the result of a $10,000,000 combination will be the second largest manufacturer in the industry. It is stated that True, Webber & Co., of Boston, will make the offering to the public soon.

Amalgamated Phosphate Bonds Sold

NATIONAL CITY CO., New York, have sold at 98 and interest, to yield 6.27%, $1,500,000 1st (closed) mortgage sinking fund 6% gold bonds of the Amalgamated Phosphate Co.

The following data are from a letter of J. O. Hammitt, vice president, American Cyanamid Co.:

Company.—Controlled through 100% stock ownership by the American Cyanamid Co. Owns extensive phosphate rock properties located in the land pebble phosphate field of Florida. The properties of the company rank among the foremost in the United States from the standpoint of annual production of phosphate rock. The product is sold by the American Cyanamid Co. principally to fertilizer manufacturers, and credit losses on such sales have amounted to less than 1/100 of 1% during the past five years.

The American Cyanamid Co. has operated the properties of the Amalgamated Phosphate Co. since January 1, 1917. It also operates certain adjacent phosphate rock producing properties which it owns and will transfer to the Amalgamated Phosphate Co., whereupon the latter company will own and operate properties which will comprise over 6,500 acres of land containing proven deposits of phosphate rock, power plant facilities, town site, etc., constituting a complete mining property and equipment sufficient to produce economically one million tons of phosphate rock per annum. The properties are thoroughly equipped in modern manner, and have excellent water supply for hydraulic operations and ample railroad facilities.

The properties have been examined by Arthur D. Little, Inc., consulting engineers, who estimate that, as of August 1, 1926, the land contained 8,169,672 long tons of standard grade phosphate rock, sufficient for 10.9 years of operation based on an annual output of 750,000 long tons.

Purpose.—Proceeds will be used to retire $573,000 1st mortgage 5% bonds which will mature September 1, 1926; to provide in part for the acquisition of the aforementioned property from the American Cyanamid Co.; and for other corporate purposes.

Agreement with American Cyanamid Co.—American Cyanamid Co. has entered into an agreement with the Amalgamated Phosphate Co. whereby the American Cyanamid Co. obligates itself to purchase the entire output of the Amalgamated Phosphate Co. at such prices and on such terms as will assure the Amalgamated Phosphate Co. income from the operation of its properties adequate to meet all expenses, taxes and interest and sinking fund charges on these bonds. In said agreement the American Cyanamid Co. also obligates itself to advance and pay to the Amalgamated Phosphate Co. from time to time, as required, any amount or amounts required by the Amalgamated Phosphate Co. to meet interest and sinking fund charges on these bonds. The term of the agreement is 15 years from July 1, 1926.

Earnings.—The properties of the Amalgamated Phosphate Co. have been operated under lease by the American Cyanamid Co. since January 1, 1917; thus the income of the Amalgamated Phosphate Co. since that date has consisted primarily of rentals under the lease and of interest and dividends on investments owned. The following statement has been prepared to show the combined sales and earnings from the properties and investments of the Amalgamated Phosphate Co. and the properties which will be transferred to the Amalgamated Phosphate Co. by the American Cyanamid Co.

COMBINED SALES AND EARNINGS OF AMALGAMATED PHOSPHATE CO.

Fiscal Years Ending June 30—	1923	1924	1925	1926	Annual Average
Tonnage	527,153	481,316	612,363	794,696	603,882
Net sales	$1,313,226	$1,226,661	$1,485,053	$2,303,993	$1,582,233
Net before depreciation, depletion, interest and Federal taxes	627,053	588,709	572,425	593,014	595,300
Depreciation and depletion	323,566	309,833	337,038	366,976	334,353
Available for interest and Federal taxes	303,486	278,876	235,387	226,037	260,947

BALANCE SHEET AS OF JUNE 30, 1926 (AFTER THIS FINANCING)

Assets—		Liabilities—	
Cash	$ 117,855	Current liabilities	$ 123
Accounts receivable	17,000	First mortgage bonds	1,500,000
Inventory	220,955	Capital stock (par $100)	3,200,000
Plant, property and equipment	3,619,539	Surplus	194,084
Investments	715,239		
Deferred charges	203,619	Total (each side)	$4,894,207

Arrange for Machinery Exhibit at Sand and Gravel Convention

TWENTY-ONE prospective exhibitors met at Hotel Gibson, Cincinnati, Ohio, on Monday, September 14, and expressed their wish to exhibit at the National Sand and Gravel convention. This is to be held at Hotel Gibson, Cincinnati, O., January 17, 18 and 19, 1927.

The privilege of exhibition is confined to those who are associate members of the National association and those who have been regular advertisers in the *National Sand and Gravel Bulletin.*

Booths are to be rented at $25, which includes everything in the way of building the booth and decorating it and painting a sign to be placed above the front. All signs will be uniform. Prospective exhibitors will receive a prospectus with floor plan and full details in a few days, mailed from the Washington office of the association. The details cover everything necessary to know regarding shipment of exhibits, clearance available, allowable floor weights and the like.

The details of booth construction and decoration will be in charge of Mr. Fern, who handled the same work for the exhibit of the National Crushed Stone Association at the 1925 meeting.

Fred Hall was chairman of the meeting, which was informal and wholly given up to practical discussions of the exhibit features, such as the use of motion pictures and the like. Earl Zimmerman, of the Ohio Gravel Ballast Co., gave much of the needed information which he had acquired with that end in view. V. P. Ahern, executive secretary, and Stanton Walker, chief of the bureau of engineering, represented the National association.

The manufacturers' representatives and others who intended to exhibit who were present and registered were:

R. H. Baughman, Morrow Manufacturing Co., Wellston, Ohio.

H. M. Davison, Hayward Co., 50 Church St., New York.

H. R. Hayes, Mid-West Locomotive Co., Cincinnati.

H. C. King, Martin-Parry Corp. and Galen All-Steel Body Corp., Cincinnati.

P. A. Marshall, Industrial Works, Cincinnati.

J. A. Frost, Clyde Iron Works, Duluth, Minn.

George E. Courcy, Rep. Chain-Belt Co., Cincinnati.

W. H. Towne, Gifford-Wood Co., Chicago.

W. A. Miller, Goodman Manufacturing Co., Chicago.

John H. McGowan, John H. McGowan Co., Cincinnati.

R. L. Wilkinson, Cincinnati Rubber Manufacturing Co., Cincinnati.

A. A. Levison, Blaw-Knox Co., Pittsburgh, Penn.

R. G. Foley, Queen City Supply Co., Cincinnati.

D. S. Guilfoil, Sauerman Bros., Inc., Chicago.

C. S. Huntington, Link-Belt Co., Chicago.

Albert C. Reed, W. S. Tyler Co., Cleveland, Ohio.

L. M. Weise, Pit and Quarry, Chicago.

Edmund Shaw, Rock Products, Chicago.

Holmes Takes Up New Duties at Missouri State University

M. E. HOLMES has become the head of the ceramics department of Missouri State University. He will attempt to give the work a practical and industrial aspect for which his wide experience with the Bureau of Mines has fitted him. The course will conform to those offered in other schools, although special attention will be given to refractories and more work on lime and gypsum will be included than is customary.

M. E. Holmes

Mr. Holmes holds a Ph.D. degree from Cornell, where he minored in economic geology which included work in ceramics. All his experience since leaving Cornell has been in ceramics of one kind or another. During the last two years Mr. Holmes' work at the Bureau of Mines has been on refractories. He has had a thorough and extensive experience in the fundamentals of refactories and particularly in physical chemistry and chemical engineering.

He will also do consulting work on lime, gypsum and basic refractories.

Montgomery Gravel Company's New Plant Almost Completed

THE new plant of the Montgomery Gravel Co. at Pruitts, Ala., representing an investment of approximately $200,000, will, according to announcement of C. B. Ireland, vice-president of the company, be ready for operation within a short time.

The new plant, within the switching limits of Montgomery, Ala., will have a capacity of 40 cars per day, which can be doubled at any time by the addition of a night shift. The equipment includes a 12-in. suction dredge.

The property of 600 acres was purchased some time ago, the major acreage from the Vizard Investment Co. and the remainder from W. W. Brand and Larry Hunter.

With the original plant of the company at Arrowhead, near Mt. Meigs, the properties of the company are said to have a valuation of approximately $500,000. The combined output of the two plants will be about 100 cars a day.—*Montgomery (Ala.) Times.*

Arkhola Company Starts Operation

THE Arkhola Sand and Gravel Co. has started operation at their recently opened plant on the banks of the Arkansas river, near Ft. Smith, Ark. Railroad sidings running into the main line of the Kansas City Southern and the St. Louis-San Francisco railroads and which are over two miles long have been laid. The capacity of the plant is said to be about 1500 tons of washed and screened sand and gravel per day.

The Arkhola company is a subsidiary of the Yahola Sand and Gravel Co. of Muskogee and Fort Gibson, Okla. Walter S. Dills of Muskogee is manager of both concerns. W. B. Pattison will be in charge of the Arkhola company's operations.—*Little Rock (Ark.) Gazette.*

C. C. Jordan New P. C. A. District Engineer at Birmingham

C. C. JORDAN has been appointed district engineer in charge of the Birmingham office of the Portland Cement Association, succeeding W. C. Ross, resigned.

For the past two years Mr. Jordan has been a field engineer at the Nashville office of the association.

In 1922 and 1923 he was with the National Cement Co. of Birmingham, and for two years prior to that a field engineer in Louisiana for the Portland Cement Association.

Mr. Jordan is a veteran of both the Spanish-American and the World Wars. In the former he was with the First Tennessee and Thirty-second Infantry regiments; in the latter, a lieutenant and captain in the engineering corps, serving in France about two years, part of the time under General Dawes.

Traffic and Transportation

EDWIN BROOKER, Consulting Transportation and Traffic Expert
Munsey Building, Washington, D. C.

Proposed Changes in Rates

THE following are the latest proposed changes in freight rates up to the week beginning September 13:

CENTRAL FREIGHT ASSOCIATION DOCKET

13984. To establish rating of 83.33% of sixth class on **crushed stone** in bags, carloads, between C. F. A. territory, also from C. F. A. territory to destinations east of Western Termini of Eastern Trunk Lines, including Canada, subject to a minimum weight of 50,000 lb.

Note—This rating is to be published as an item in the exceptions and is not to supersede any commodity rates.

Present basis—In absence of specific commodity rates, classification basis of sixth class applies.

13985. **Crushed stone** in bulk in open top cars, carloads, Romona, Ind., to Cairo, Ill. Present rate, 21½c; proposed, 138c per net ton.

Proposed rate will not be subject to Jones' Combination Tariff 228, U. S. No. 1.

13996. To establish on **agricultural limestone** in bulk in open top cars, carloads, from Milltown, Ind., to points on the B. & O., C. I. & L. and Penna. Railroads within 60 miles of New Albany, Ind., rates on basis of following mileage scale:

Distance	Rates in cents per ton of 2000 lb. Single Line	Multiple Line
20 miles and under	60	70
30 miles and over 20 miles	65	75
40 miles and over 30 miles	70	80
50 miles and over 40 miles	75	85
60 miles and over 50 miles	80	90
70 miles and over 60 miles	85	95

14001. **Crushed stone** and crushed stone screenings, carloads, Bluffton, Ohio, to Toledo, Ohio. Route, via N. Y. C. & St. L. (L. E. & W. District), Fostoria and Hocking Valley R. R. Present rate, sixth class; proposed, 80c per net ton. Proposed rate will not be subject to Combination Tariff, I. C. C. U. S. 1.

14002. **Gravel and sand** (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica), carloads, Marion, Ohio, to Bucyrus, Ohio. (O. C. L.) Present rate, 80c per net ton; proposed, 60c per net ton.

14003. **Crushed stone** in bulk in open top cars, carloads, Bloomville, Ohio, to Crestline, Ohio. Present rate, 70c per net ton; present and proposed rate not subject to Jones' Tariff 228, U. S. 1. Proposed, 60c per net ton.

14007. **Agricultural limestone**, carloads, in bulk in open top equipment, carloads, Kenton, Ohio, to Ohio. (Per net ton.)

To points in Ohio, viz.:	Proposed Rate		Proposed Rate
Beach City	100	Minerva	120
Bedford	100	Mt. Vernon	100
Brewster	100	Newark	100
Canton	100	Robertsville	120
Chagrin Falls	100	Sherrodsville	130
Cleveland	100	Sugar Creek	110
East Greenville	100	Valley Junction	120
Massillon	100	Wellington	100

14040. **Sand**, lake and beach, carloads, Michigan City, Ind., to Port Huron and Imlay City, Mich. Present rate, 202c per net ton; proposed, 165c per net ton.

14041. **Crushed stone**, carloads, Whitehouse, Ohio, to Williston, Ohio. Present, Fremont, Ohio, rate of 90c per net ton applicable under intermediate clause; proposed, 75c per net ton.

14042. **Gravel and sand** (except blast, core, engine, filter, fire and furnace, foundry, glass, grinding or polishing, loam, molding or silica), carloads, Wolcottville, Ind., to Paulding, Ohio. Present rate, 13½c; proposed, 100c per net ton.

14045. **Crushed stone**, carloads, Kewaunee, Manitowoc and Milwaukee, Wis., also Menominee and Manistique, Mich., to Detroit, Mich., and Toledo, Ohio. Present rate, 136c per net ton; proposed, proportionate rate of 150c per net ton.

14046. **Gravel and sand**, except blast, core, engine, filter, fire or furnace, foundry, glass grinding or polishing, loam, molding and silica, carloads, Columbus, Ind., to North Vernon, Ind. Present rate, 75c per net ton; proposed, 70c per net ton.

14049. **Sand** (except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica) and gravel, carloads, Jamestown, Penn., to Erie, Penn. Present rate, 90c per net ton; proposed, 80c per net ton.

14051. **Crushed stone**, carloads, Putnamville, Ind., to Centre Point, Ind. Present rate, 14c; proposed, 85c per net ton.

14061. **Gravel and sand**, except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica, carloads, Ferguson, Ind., to Sturgis, Mich. Present rate, sixth class; proposed, 95c per ton of 2000 lb., via N. Y. C. & St. L. R. R. (Lake Erie & Western District), Fort Wayne, Ind., and P. R. R.

14062. **Gravel and sand**, except blast, core, engine, filter, fire or furnace, foundry, glass, grinding or polishing, loam, molding or silica, carloads, Lafayette, Ind., to Clark's Hill, Ind. Present rate, 70c per net ton; proposed, 60c per net ton.

14064. **Stone, crushed** (in bulk), carloads, Bellevue, Ohio, to Jamestown, Penn., and Simons, Ohio. Present rates, 18½c to Jamestown, Penn., and 150c per net ton to Simons.

14065. **Sand and gravel**, carloads, from siding of the Buck Hill Washed Sand and Gravel Co., west of Canton, Ohio, to Alliance, Ohio. Present rate, 70c per net ton of 2000 lb.; proposed, 60c per ton of 2000 lb.

14067. **Crushed stone**, carloads, Spore, Ohio, to Copenhaven, W. Va. Present rate, 195c per net ton. (Charleston combination.) Proposed, 140c per net ton.

14070. **Crushed stone**, carloads, White House, Ohio, to Michigan. (In cents per net ton.) Present, to Temperance, Mich., sixth class; Samaria, Mich., sixth class; Lulu, Mich., sixth class; Federman, Mich., sixth class; Dundee, Mich., sixth class; Azalia, Mich., sixth class; Milan, Mich., sixth class; Urania, Mich., sixth class; Pittsfield, Mich., sixth class; Ann Arbor, Mich., sixth class. Proposed, to Temperance, Mich., 76c per net ton; Samaria, Mich., 76c per net ton; Lulu, Mich., 76c per net ton; Federman, Mich., 76c per net ton; Dundee, Mich., 88c per net ton; Azalia, Mich., 88c per net ton; Milan, Mich., 88c per net ton; Urania, Mich., 88c per net ton; Pittsfield, Mich., 88c per net ton; Ann Arbor, Mich., 88c per net ton.

Delivery line—Ann Arbor R. R.

TRUNK LINE ASSOCIATION DOCKET

13908. **Lime**, common, hydrated, quick or slacked, in bags, barrels, casks, iron drums or in bulk, carloads, from Buffalo, N. Y., to Clearfield, Penn., 15½c per 100 lb.

Reason—Proposed rate compares favorably with other rates at present in effect within Trunk Line territory for approximately the same or greater mileage. File 42452.

SOUTHWESTERN FREIGHT BUREAU DOCKET

9609. **Lime**, from Ash Grove, Mo., district to Iowa. To establish rate of 19c per 100 lb. on lime, carloads, minimum weight 40,000 lb., from Ash Grove, Mo., district, per St. L.-F. Ry. Tariff No. 69-K, to Sioux City, Sargents Bluff, Salix, Sloan, Whiting, Onawa, Blencoe and River Sioux, Iowa, on the C. & N. W. Ry. It is stated that the proposed rate is now applicable via the C. St. P. M. & O. Ry. to Sioux City, Iowa, and should, therefore, be applied for account of the C. & N. W. R. R. also. The other points were added to clear the Fourth Section.

9625. **Sand**, from Klondike, Mo., to Blackwell, Okla. To establish rate of 13½c per 100 lb. on sand, carloads, minimum weight 80,000 lb., from Klondike, Mo., to Blackwell, Okla. It is stated that as shippers at Klondike are in competition with shippers located at Guion, Ark., and Pacific, Mo., and as the proposed rates are either now in effect or are authorized from these two points that Klondike should enjoy the same rates.

9550. **Limestone**, ground, from Joplin-Webb City Dist. to St. Joseph, Mo. To establish from Joplin-Webb City Dist. to St. Joseph, Mo., rate of 8½c per 100 lb. on ground limestone, minimum weight 90% of marked capacity of car, except when loaded to full visible capacity, actual weight will apply; but in no case shall the minimum weight be less than 40,000 lb. It is stated that limestone rates are generally the same as rates on chatt and as the rate on chatt from the Webb-City-Joplin Group is 8½c, this rate should also be applied on ground limestone.

9564. **Lime**, from Mercer, Ark., to St. Joseph, Mo. To provide minimum weight of 30,000 lb. on lime, carloads, from Mercer, Ark., to St. Joseph, Mo. It is stated that the minimum weight in northern territory is 30,000 lb. and, therefore, same rate should apply from Mercer, Ark.

SOUTHERN FREIGHT ASSOCIATION DOCKET

29089. **Sand and gravel**, from Decatur and Albany, Ala., to Columbia, Glendale and Pleasant Grove, Tenn. It is proposed to establish reduced rate of 100c per net ton on sand and gravel, carloads, minimum weight 90% of marked capacity of car, except when cars are loaded to their visible capacity, actual weight will govern, from Decatur, Ala., to Glendale and Pleasant Grove, Tenn., and from Albany, Ala., to Columbia, Glendale and Pleasant Grove, Tenn.; also rate of 100c per net ton on gravel, carloads, from Decatur, Ala., to Columbia, Tenn. Proposed rate is the same as rate now applicable on sand, carloads, from Decatur, Ala., to Columbia, Tenn.

29090. **Crushed marble** from Tate, Ga., to Virginia cities. In lieu of combination rates, it is proposed to establish the following through rates on marble, crushed, carloads, minimum weight to Roanoke, 40,000 lb., to Portsmouth, Richmond, Norfolk and Suffolk, 60,000 lb., from Tate, Ga.: To Portsmouth, Va., 306; Richmond, Va., 293; Norfolk, Va., 307; Suffolk, Va., 302; Roanoke, Va., 360c per net ton; same as the current rates on crushed stone from Whitestone, Ga., to these destinations.

29107. **Gravel**, from Memphis, Tenn., to East Point, Lakewood Station and Oakland City, Ga. It is proposed to establish a rate of 203c per net ton on gravel, carloads, from Memphis, Tenn., to East Point, Lakewood Station and Oakland City, Ga., in connection with usual available routes; this rate being already in effect via the N. C. & St. L. Ry. to Atlanta, Ga., proper.

28966. **Lime**, between stations on the Miss. Central R. R. It is proposed to revise the local mileage rates on the M. C. R. R., on lime, common, carloads, minimum weight 30,000 lb., for interstate application, between stations on that line, to more nearly conform to the scale adopted by Trunk Lines than is the present adjustment. The present scale ranges from 100c per ton for 5 miles up to 190c from 50 miles, 260c for 100 miles and 320c per ton for 170 miles. The proposed scale ranges from 100c for 5 miles up to 190c for 50 miles, 260c for 100 miles and 300c per ton for 170 miles.

28973. **Gravel**, from Gulfport, Miss., to Biloxi, Miss. In lieu of intrastate rate of 80c per net ton, it is proposed to establish intrastate rate of 54c per net ton on gravel, carloads, minimum weight 90% of marked capacity of car, except when cars are loaded to their visible capacity, actual weight will govern, from Gulfport to Biloxi, Miss., which rate reflects the same basis recently observed in establishing rates from Gulfport and Ansley, Miss., to Miss. City, Miss.

28975. **Limestone**, from Sparta, Tenn., to Athens, Bogart and Elberton, Ga. Present rates: To Athens, 234c; to Elberton, 243c per net ton; no through rates in effect to Bogart. Proposed rates on ground or pulverized limestone or marble, carloads, minimum weight marked capacity of car, except when car is loaded to full visible capacity, actual weight will apply, from Sparta, Tenn.: To Athens and Bogart, Ga., 230c; Elberton, Ga., 234c per net ton, made on basis of the proposed Georgia scale, less 10%, using S. A. L. Ry. distance beyond Atlanta.

28992. **Ground flint and glass sand**, from Mendota and Silica, Va., to Parkersburg, W. Va. In lieu of combination rate, it is proposed to establish through rate of 442c per net ton on ground flint and glass sand, carloads, minimum weight 90% of marked capacity of car, except where car is loaded to cubical or visible capacity, actual weight will apply from and to points mentioned, based by use of proportion of 237c to Cincinnati, plus proportion of 205c beyond.

28995. **Crushed stone**, etc., from Frankfort, Ky., to Long Run, Eastwood and Lincoln Ridge, Ky. In lieu of present rate of 100c per net ton, it is proposed to establish rate of 76½c per net ton on stone, crushed, broken, rubble and ballast, carloads, minimum weight 90% of marked capacity of car, except when cars are loaded to their visible capacity, actual weight shall govern, from Frankfort, Ky., to Long Run, Eastwood and Lincoln Ridge, Ky.

29012. **Sand and gravel**, from Kenneth, S. C., to North Carolina points. It is proposed to establish the following reduced rates on sand and gravel, carloads, minimum weight 90% of marked capacity of car, except when cars are loaded to

their visible capacity actual weight will govern, from Kenneth, S. C.: To Greensboro, N. C., 167c; Raleigh, N. C., 144c; Durham, N. C., 167c; Henderson, N. C., 158c; Louisburg, N. C., 158c per net ton. The rates proposed are made by use of the scale submitted by carriers to the Alabama and Georgia Public Service Commission for joint line application over trunk lines, less 10%.

29080. Sand, from Mack, Ga., to West Farm, Lee and Ellaville, Fla. In lieu of combination rates it is proposed to establish the following through rates on sand, carloads, minimum weight, 90% of marked capacity of car, except when cars are loaded to visible capacity, actual weight will apply, from Mack, Ga.: To West Farm and Lee, Fla., 122c; to Ellaville, Fla., 126c per net ton; made on basis of the proposed Georgia scale, less 10%.

NEW ENGLAND FREIGHT ASSOCIATION DOCKET

10840. **Stone, broken or crushed,** carloads, minimum weight in bulk, in gondola or other open cars, 90% of marked capacity of car, to Marshfield and Marshfield Hills, Mass., from Branford (Pine Orchard Quarry); E. Berlin (Beckleys Quarry); East Haven; E. Wallingford (Reed's Gap Quarry); Meriden (York Hill Quarry); Mount Carmel; New Britain (Cook's Quarry) and Rocky Hill, Conn., $1.30 per ton of 2,000 lbs. Reason—To enable producers to compete for tonnage to move via rail, which cannot be done at present rates.

10861. **Waste limestone,** carloads, minimum weight 50,000 lb. from Winooski, Vt., to Port Henry, N. Y., $2.27 per ton of 2000 lb., via Rouses Point, N. Y., Delaware & Hudson Co. Reason—Necessary to be on the same basis as waste limestone from Stanbridge, Que., to Port Henry, N. Y.

10894. **Talc, crude, ground or lump,** carloads, minimum weight 50,000 lb., from Johnson, Vt., to South Brewer, Me., 22c; to Lincoln, Me., 23c; via St. J. & L. C. R. R., St. Johnsbury, Vt., Me. C. R. R. Reason—Comparable with rates now published to contiguous points.

Florida Rock Phosphate Rates

ATTORNEY-EXAMINER John McChord, in No. 17370, Meridian Fertilizer Factory vs. Atlanta Coast Line et al. and part of fourth section application Nos. 543, 703, 2045, 1952, 2138, 601, 1573, 1548, and 2043, said the Interstate Commerce Commission should find rates on phosphate rock from Tilphosco and Brewster, Fla., to Meridian unreasonable and unduly prejudicial but not discriminatory. He said fourth section relief shoul be denied in part, and granted in part.

The complaint, as summarized by the examiner, alleged the rates charged between July 26, 1923, and March 3, 1925, from the Florida points to Meridian were and are unjust, unreasonable, discriminatory, and unduly prejudicial, in violation of the first and third sections and also in violation of the fourth section. The complaint asked for reparation and rates for the future. The Armour Fertilizer Works of New Orleans intervened in opposition to a grant of relief to the complainant under section 3 and joined with the railroads in contending that the allegations of the complainant was not sufficient to constitute a charge of unreasonable preferance or advantage or undue prejudice or disadvantage under the third section and did not comply with the commission's rules of practice.

The examiner said the language of the complaint could and would be fairly construed as alleging that section 3 was violated by a disregard of the provisions of section 4 in charging of rate of $5.07 per ton to Meridian, an intermediate point, and that an allegation of undue or unreasonable preference or advantage to New Orleans only was sufficiently alleged to put the defendants upon notice to that extent under the third section. The shipments covered by the complaint consisted of 227 carloads on which the rate of $5.07 was imposed.

McChord said the Commission should find that the rate from the Florida points to Meridian was and is unreasonable, and, as compared with the contemporaneous rate to New Orleans, was and is unduly prejudicial but not discriminatory, and for the future will be unreasonable and unduly prejudicial to the extent that it exceeded or may exceed $4.62 per gross ton, the rate to New Orleans. He said it should award reparation to the basis.

McChord said the Commission should further find that application No. 703, of the Atlantic Coast Line, No. 1952, of the Louisville & Nashville, No. 1573, of the Seaboard, wherin authority was sought to continue rates on phosphate rock between points in Florida and New Orleans and other gulf ports, over routes 1 and 2 served by those carriers through River Junction, Fla., and Montgomery, Ala., respectively, thence to New Orleans, over the L. & N., which were higher than those charged at points of destination, had not been justified; that No. 245, of the Illinois Central, No. 2043, of the Yazoo and Mississippi Valley, and No. 2138, of the Mobile and Ohio to Like effect had not been justified. He said that application No. 601, of the New Orleans and Northwestern and No. 1548, of the Southern Railway should be granted with the usual restrictions as to circuity and the lowest combinations.—*Traffic World.*

Rates on Magnesite Stucco

EXAMINER FRANK E. MULLEN, of the Interstate Commerce Commission, has recommended an award of reparation in No. 17661, Badger Lumber & Coal Co. et al. vs. Santa Fe et al., on a proposed finding that interstate rates on magnesite stucco from Chicago, Waukegan and Ottawa, Ill., Cedar Rapids and Crandic, Ia., and Kansas City, Mo., to destinations in Kansas, Missouri, Oklahoma and Arkansas were unreasonable.

The rates in issue were attacked as unreasonable, and, as compared with rates on stucco and other plasters, unjustly discriminatory and unduly prejudicial. Some of the rates were alleged to be in violation of the long-and-short-haul clause of Section 4.

The examiner said Class D rates were applied on most of the shipments. On shipments to Oklahoma, Class E rates were applied generally except in some instances where rates equal to the rates on stucco were applied. The class rates charged ranged from 17.5 cents from Cedar Rapids to Hannibal, Mo., to 67 cents from Ottawa to Altus, Okla. The rates contemporaneously applicable on stucco, according to complainants' exhibits, ranged from 15.5 cents to 48.5 cents.

The examiner said the matter of rates on magnesite stucco in part of the territory included in the complaint had been before the Commission in Rocbond Co. vs. A. T. & S. F., 104 I. C. C. 517, decided December 5, 1925, and that the Commission therein found that magnesite stucco came within the general commodity description stucco. Following the decision in the Rocbond case, the carriers in Western Trunk Line territory and the Southwestern Lines authorized the publication of the stucco rates to apply on magnesite stucco, the examiner said the testimony showed. Following the Rocbond case, the examiner said the Commission should find that the rates from points of origin to points of destination described in the complaint on magnesite stucco composed of stucco mix magnesium chloride and crushed-rock dash shipped in separate packages in the same car, the magnesium chloride not to exceed 20% and the crushed-rock dash not to exceed 50% of the gross weight of the shipment, were unreasonable to the extent they exceeded the rates on stucco contemporaneously applicable from the same points of origin to the same points of destination. The examiner said allegations as to violations of Sections 2, 3, 4 and 6 of the act had not been sustained. He recommended reparation to the basis of the rates found reasonable.

Cement Rates Too High

IN No. 16619, Security Cement & Lime Co. vs. Baltimore & Ohio et al., mimeographed, the Commission, by division 3, has found rates charged on cement, in carloads from Security, Md., through the District of Columbia to Maryland destinations served by the Washington, Baltimore & Annapolis Railroad, an electric line, unlawful between January 1, 1922, and January 4, 1923, inclusive. It found rates on cement from Security moving interstate to the same destinations between January 5, 1923, and May 15, 1925, not unreasonable. It made similar findings as to rates on cement to stations on the old Annapolis Short Line now controlled by the Washington, Baltimore & Annapolis prior to and on and after March 30, 1923.

The complainant's claim that the rates from January 1, 1922, to January 4, 1923, were unlawful and in excess of those named in the tariffs then in effect, was based upon the combination rule contained in the tariffs and upon the Commission's report in Sligo Iron Store Co. vs. Western Maryland, 61 I. C. C. 643 and 73 I. C. C. 551, and other similar cases. The Commission held that the Baltimore & Ohio Tariff, I. C. C. 16971, as amended and in effect between January 1, 1922, and January 4, 1923, had to be read strictly and in accordance with the findings in the Sligo case, and that so read, the lawful rates applicable from Security to Maryland destinations served by the Washington, Baltimore & Annapolis were $2.30 per ton from January 1, 1922, to June 30, 1922, inclusive, and $2.10 from July 1, 1922, to January 4, 1923.

Sand Rate Recommended

IN No. 17873, Traffic Bureau-Chamber of Commerce (Lynchburg, Va.) vs. West Jersey and Seashore et al., Examier E. P. Hurley said the Interstate Commerce Commission should find the rate on sand, from Cape May, N. J., to East Radford, Va., applied on shipments made in June, 1924, was applicable but unreasonable to the extent it exceeded, exceeds, or may exceed, a rate of $4.95 per net ton, to which basis, he said, reparation should be awarded. He said that parts of fourth section application No. 1625, heard in connection with this case, should be denied.

Sand and Gravel Industry of Illinois

Extracts of an Address to Illinois Lumber and Building Material Dealers

By T. E. McGrath
President of the Illinois Sand and Gravel Association

DURING the past 20 years I have seen the sand and gravel industry grow from an infant to a full grown industry, from a wayside pit, man, wagon and team business to a business that now takes its place proudly among the other important industries of the state and nation. A quarter of a century ago only a few gravel washing plants were in existence. The sand and gravel used in those days was an inferior product hauled from local creeks and banks. The rapid development of the portland cement industry carried with it a demand for a suitable, clean, graded standardized fine and coarse aggregate. Sand and gravel being a natural concrete building material, many of the available sand and gravel deposits throughout the country were developed and millions of dollars have been spent during the past few years in building and perfecting washing and screening plants. These modern plants are equipped with machinery specially designed to properly clean and grade material that will meet the present day specifications that are drawn by engineers, architects, highway officials and other authorities on concrete to assure the highest and most desirable results of concrete.

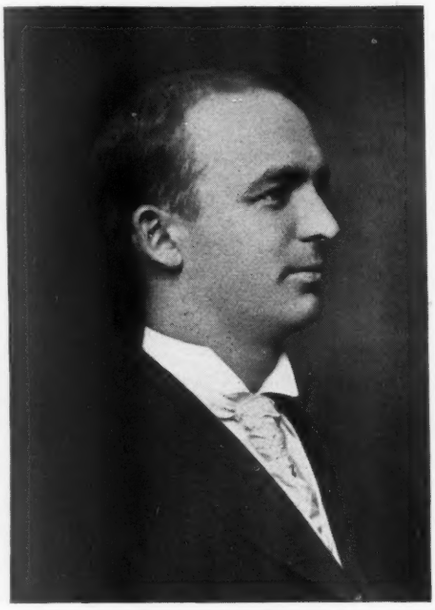
Sand and gravel are basic commodities. Their uses are so well known to you men and the general public that it is not necessary to mention them here. Deposits of sand and gravel exceed all other mineral deposits and are found in nearly every state in the Union. There is a sand and gravel pit and a gravel washing plant behind every modern building, every concrete road—there is a place for sand and gravel in every step our state and nation takes along the path of public progress. Today there are about 10,000,000 tons of sand and gravel used yearly in the state of Illinois alone, divided about equally between Chicago and downstate; that is, there are about 5,000,000 tons used in the Chicago district and the other 5,000,000 tons are consumed downstate. This tremendous volume of material creates about $7,000,000 in freight revenue for the carriers that traverse Illinois. Bituminous coal is the only commodity whose volume and freight traffic exceeds that of sand, gravel and stone. Sand, gravel and stone exceed the volume of lumber movements and anthracite coal as well. From a railroad revenue standpoint, sand, gravel and stone traffic exceeds the total of cement, brick, artificial stone, lime plaster, sewer pipe and drain tile. The Interstate Commerce Commission reports that revenue to the railroads from sand, gravel and stone transportation during the four years, 1921 to 1924 inclusive, as follows:

1921	$ 78,085,605
1922	91,035,815
1923	120,889,000
1924	124,356,127.60

A survey of the output of the plants owned and operated by the members of the Illinois Sand and Gravel Association indicates that approximately 40% goes into the construction of roads, the remaining 60% is used chiefly in the construction of industrial plants, as railroad ballast, in street pavement, sidewalks and domestic building of all kinds.

Sand and gravel are recognized standard building materials. Their use, when properly cleaned and graded, assures the highest results in concrete. They are low priced commodities, sensitive to freight rates and handling charges. This is a factor which ultimately will bring about a closer co-operative relationship between the producers and the dealers. In my judgment, it will not be long until the dealers in cities of 5000 and cities as large as Springfield will incorporate, joint separate companies to eliminate all unnecessary handling charges and arrange to procure their retail supply of sand and gravel from a central plant which will be equipped with locomotive cranes, large storage bins and other labor and time saving devices. It is not necessary for me to outline to you dealers the thousands of dollars that could be saved in practically every city of any size if a central sand and gravel handling unit of this kind can be worked out. It will not affect in any way the retailing of the material nor will it retard or restrict the sales initiative of the individual companies who will jointly own the central plant.

Every dealer under this plan would be on an equal basis at the plant. They will be relieved of paying freight charges and a supply of all sizes and grades of material will always be available. The dealer and the producer have many things in common. Their interests are mutual. Their best interests lie in "Pricing for Profit" and helping each other stabilize their respective markets. In closing, may I leave this thought with you—rarely does a dealer find it profitable to handle a commodity that is not bought on a highly stabilized market. Your interests in the long run are identical in this respect with the producer. I am pleased to be with you today, and on behalf of the members of the Illinois Sand and Gravel Association, I thank you for the co-operation and consideration you have and are now extending our industry.



T. E. McGrath

Egyptian Portland to Build Plant at Holly, Michigan

ACCORDING to recent report, the Egyptian Portland Cement Co., Port Huron, Mich., is planning the construction of a new mill near the Rapalle, Allen and Lacey lakes near Holly, Mich. J. A. Acker, assistant general manager of the company, it is said, will be the superintendent in charge of construction.

The Egyptian company owns and operates cement plants at Fenton and Port Huron, Mich. The Fenton plant is a wet process operation producing about 1800 bbl. per day from nine kilns, 6x60 ft., and the Port Huron plant using the dry-process has a capacity of 3200 bbl. per day from two kilns 11¼x200 ft. Maynard W. Smith is president and general manager of the company. Offices are at 2306 Port Huron street, Port Huron, Mich.

Fire Damages Gravel Plant

A RECENT fire at the plant of the Little Missouri River Gravel Co., Murfreesboro, Ark., caused considerable damage to equipment and destroyed the company office and a power house. The fire started at the top of the screening plant and despite the efforts of the townspeople could not be checked before causing the damage to the machinery and buildings. The amount of loss was not determined and the intentions of the company as to replacement have not been decided.—*Murfreesboro (Ark.) Courier.*

Cement Products

TRADE MARK REGISTERED WITH U. S. PATENT OFFICE

Plant Produces 20,000 Building Units Daily

Henderson Structural Units Co., Pittsburgh, Penn., Reputed to Be Largest Producers in the Country

THE plant of the Henderson Structural Units Co. of Pittsburgh, Penn., has attained a considerable reputation throughout the country as the largest producer of cement block and tile. Its output is 20,000 units daily. Block and tile are all that it makes with the exception of some simple precast trim pieces such as lintels and sills.

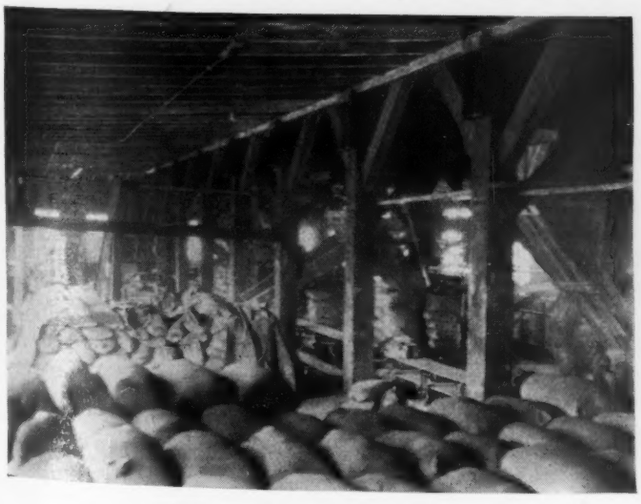
It is almost unique among plants of large capacity in that it was planned and built for a large output from the first. There are other large output plants which have grown to their present size from a small beginning and the plant layout shows it. But in the Henderson plant the buildings were put up and the equipment was bought for the plant as it stands at the present time.

Before building this plant Albert Henderson, who is the general manager, visited the more important plants in the United States and spent some time abroad studying the methods and machinery used in other countries. Hence he had an unusual amount of experience and observation to draw from when he began to build.

Plant and part of yard of the Henderson Structural Units Co., Pittsburgh, Penn.

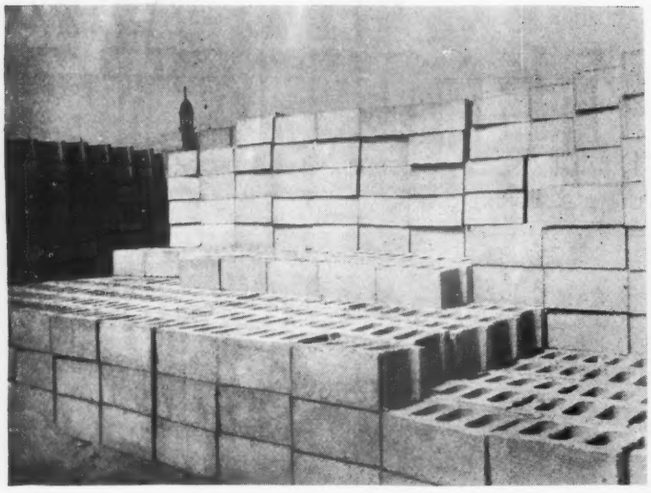
The entire output of block and tile is made on five Besser machines, two of the face-down and three of the stripper type. These are on the lower floor of a building which is about 120 ft. long and half as wide. On the upper floor of the building are the mixers, which are of both 21 and 14 cu. ft. capacity.

Both slag and sand are used as aggregate. The slag is crushed and graded especially for block aggregate and the

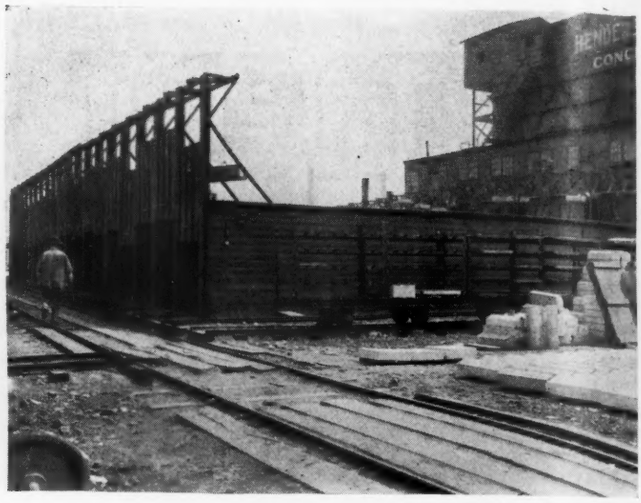


Mixing room and cement storage

Conveyor which brings sacks of cement to mixing room



Blocks are very clean and true as shown by the way they pile



Part of the 20 steam filled and heated curing rooms at the Henderson plant

sand is graded from 3/8-in. down so that it contains a considerable proportion of the coarser sizes. Both slag and sand are bought from producers. The fineness modulus is said to be about 4.25. Cement is received in sacks for convenience in handling.

Block are made with either sand or slag as aggregate, but not of mixtures of the two. The slag aggregate has the advantage of being somewhat lighter in weight.

The aggregate comes to the plant in hopper bottomed steel gondola cars which are spotted over a track hopper. From this an elevator lifts the aggregate to a cross conveyor placed above the bins. This cross conveyor has a tripper so that the aggregate may be sent to any desired bin.

As each aggregate is complete no proportioning of aggregates is needed, only the addition of cement and water. So the mixing process is simple. Each machine has its own bin and mixer. The aggregate is measured into the mixer from a hopper and gate above. Cement is added and the usual dry and wet mixing follow. Care is taken to keep the moisture uniform and the unusual uniformity of the blocks shows that this is well controlled in the manufacture.

Building units faced with silica sand and white cement

On of the delivery trucks of the company's large fleet

Cement is brought into the mixer room by the inclined conveyor shown in one of the illustrations. The car of cement which is to be unloaded is spotted at the end of this conveyor and a short and broad chute is put into the car door on which the sacks of cement are slid to the conveyor belt. From the upper end they are trucked to the cement storage back of the mixers.

From the machines the blocks go to 20 kilns or curing rooms which are both heated and filled with steam. In handling the block through the kilns the usual system of parallel tracks and transfer trucks is employed, but the cars appear unusually large.

Plain block, rock face and panel face block are made. The demand for the rock face and panel faced block is unusually heavy, as they are so much used in building private garages and structures of a similar nature.

Tile are made in 5x8x12-in. and 5x4x12-in. sizes. The whole output of tile goes into warehouses and similar industrial structures in and around Pittsburgh.

Lintels, copings and sills are faced with white cement and silica sand. They are made by hand in the usual steel molds.

The plant has its own fleet of trucks, some of which are handsomely painted, which forms an excellent advertisement for the company. The plant is at McKees Rocks, just outside of Pittsburgh, in a busy industrial district.

The company is incorporated and has its main office at the plant. Albert Henderson is manager and Sidney Henderson, his brother, is assistant manager.

Auburn Concrete Products Co., Auburn, Wash., delivering a big pipe contract

Northwestern Poured Tile Plant

Auburn, Wash., Company Also Making a Variety of Products

ONE of the most successful cement products plants of the Pacific Northwest is that of the Auburn Concrete Products Co., Auburn, Wash. Since 1923, when it was organized, the company has steadily increased its production until now its output is about 4500 stone tile and 9000 drain pipe of various sizes per day. In addition, other products such as grave markers, vases, benches, etc., are made.

The manufacture of tile is carried out in the usual way, a 1:6 mix being used. The aggregate consists of fine sand and pea-size gravel in about equal proportions. The mixture is given a dry and wet mix and then poured into molds and tamped by jogging the molds. The "green" tile is removed while still soft and brought to the curing room, where they remain in a steam atmosphere for one or two days. As most of the tile are made on order, after removal from the curing room they are sent directly to the job.

Cement drain pipe are molded and cured in the same manner as the tile, and at times as many as 9000 per day are made. Several different sizes of both ordinary and reinforced pipe are always kept in stock. King county is one of the largest customers for the pipe, using on an average of 1000 ft. of the larger sizes each month.

The company is carrying on experiments in the manufacture of ornamental cement products. An artificial granite, using a mica spar facing, is one of the products they hope to make. This will be used when proven successful for garden ornaments and grave markers, for which the company has already received orders.

The stone tile are in favor for local building, and many of the residences and public buildings such as the First Presbyterian church at Auburn, in which over 60,000 tile were used, have been built with it. C. M. Long is the manager of the Auburn Concrete Products Co., and the plant is located at 229 Twelfth St., S. E.

Over 60,000 cement tile furnished by the Auburn company were used in the construction of this church

How a New Concrete Lumber Was Invented

A YARD foreman in a barrel storage warehouse had occasion to give special fire protection to some empty barrels, and, taking some ordinary rods, some cement and cinders and ashes out of the company boiler pit, he made some board-like slabs and nailed and bolted them as he would have done with lumber of equal thickness around the barrels.

One of the officials of the company, showing an architect through the plant, was impressed by the building expert's surprise at the material used in the structure and had the fabric tested at Columbia University, where it withstood a heat of 728 deg. and a cold water drench while still hot, and which incidentally won the approval of the New York City building departments, the National Board of Fire Underwriters and other authorities.

Now a company is being formed to put this lumber substitute on the market on a mass production basis, although a number of small houses in New Jersey have been built with it.—*Dow Daily Building Reports.*

Portland Cement Output in August

Production Kept at High Level—Shipments and Stocks Decline But Are Still High

AUGUST production and shipments of portland cement were the greatest for that month in any year, according to the Bureau of Mines, Department of Commerce. Statistics compiled show about 16,936,000 bbl. to have been made; this is about 1% less than the preceding month and almost 3% greater than August, 1925. Shipments declined slightly over the last month but were still high and were above those made in August, 1925. Production of portland cement was exceeded only by that of July, 1926, while shipments were exceeded only in the two preceding months. Portland cement stocks continued to decline but at the end of August were nearly 31% higher than on August 31, 1925. These statistics, prepared by the Division of Mineral Resources and Statistics of the Bureau of Mines, are compiled from reports for August, 1926, received direct from all manufacturing plants except three, for which estimates were necessary on account of lack of returns.

Clinker Stocks

Stocks of clinker, or unground cement, at the mills at the end of August, 1926, amounted to about 7,270,000 bbl. compared with 8,515,000 bbl. (revised) at the beginning of the month.

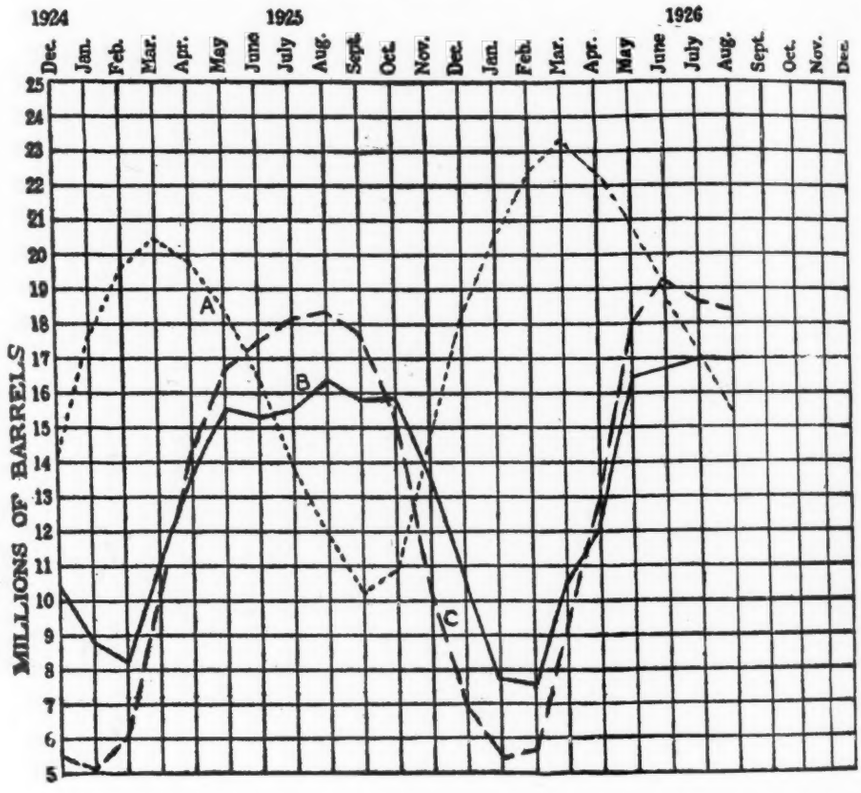
An estimate of the unground clinker by months is given below:

ESTIMATED CLINKER (UNGROUND CEMENT) AT THE MILLS AT END OF EACH MONTH, 1925 AND 1926, IN BARRELS

Month	1925	1926
January	7,017,000	9,074,000
February	9,497,000	10,931,000
March	9,962,000	12,284,000
April	9,731,000	12,934,000
May	9,053,000	11,649,000
June	7,937,000	10,086,000
July	6,961,000	*8,515,000
August	5,640,000	7,270,000
September	4,561,000	
October	4,086,000	
November	5,013,000	
December	6,469,000	

*Revised.

MONTHLY FLUCTUATIONS IN PRODUCTION, SHIPMENTS AND STOCKS OF FINISHED PORTLAND CEMENT


1924
1925
1926
Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec. Jan. Feb. Mar. Apr. May June July Aug. Sept. Oct. Nov. Dec.
MILLIONS OF BARRELS
25 24 23 22 21 20 19 18 17 16 15 14 13 12 11 10 9 8 7 6 5
A
B
C

(A) Stocks of finished portland cement at factories. (B) Production of finished portland cement. (C) Shipments of finished portland cement from factories

Distribution of Cement

The following figures show shipments from portland cement mills distributed among the states to which cement was shipped during June and July, 1925 and 1926:

PORTLAND CEMENT SHIPPED FROM MILLS INTO STATES, IN JUNE AND JULY, 1925 AND 1926, IN BARRELS*

Shipped to	1925—June	1926	1925—July	1926
Alabama	214,195	215,892	256,741	184,577
Alaska	1,284	1,130	2,816	1,386
Arizona	32,451	46,262	37,842	35,817
Arkansas	92,101	66,835	78,059	73,292
California	1,066,088	1,187,724	1,061,048	1,173,099
Colorado	120,818	124,451	118,272	117,990
Connecticut	172,564	206,301	176,644	218,375
Delaware	37,330	45,642	43,326	38,228
District of Columbia	81,334	86,218	82,133	94,852
Florida	348,330	297,204	341,849	284,281
Georgia	129,748	174,488	132,050	213,432
Hawaii	6,108	14,360	993	12,761
Idaho	28,122	54,424	28,498	47,991
Illinois	1,636,329	1,854,806	1,853,734	1,857,890
Indiana	617,360	635,118	658,042	696,653
Iowa	310,558	329,422	327,155	353,529
Kansas	233,522	247,335	226,787	230,022
Kentucky	231,491	176,187	229,652	198,902
Louisiana	100,016	106,338	99,111	112,958
Maine	43,541	66,264	41,475	67,475
Maryland	249,105	244,763	247,835	221,600
Massachusetts	350,620	338,079	386,058	331,320
Michigan	1,264,462	1,469,758	1,229,598	1,505,905
Minnesota	409,235	526,695	436,453	475,846
Mississippi	66,012	73,345	67,446	89,752
Missouri	583,561	631,184	683,097	653,615
Montana	28,904	23,114	31,486	38,749
Nebraska	181,516	187,780	203,863	172,489
Nevada	10,784	9,895	10,068	7,878
New Hampshire	40,837	48,285	41,843	55,233
New Jersey	737,572	773,450	760,944	793,625
New Mexico	18,406	16,222	16,323	14,736
New York	2,090,644	2,475,868	2,170,960	2,336,788
North Carolina	324,201	420,248	343,683	396,618
North Dakota	66,089	75,470	55,305	62,581
Ohio	1,099,767	1,310,691	1,099,016	1,247,338
Oklahoma	225,879	219,946	225,729	205,345
Oregon	134,038	150,962	143,672	151,296
Pennsylvania	1,869,299	1,697,387	1,869,377	1,618,569
Porto Rico	0	0	0	0
Rhode Island	89,213	80,912	75,383	65,525
South Carolina	85,087	47,279	75,376	53,506
South Dakota	59,120	53,091	55,487	46,987
Tennessee	185,536	206,917	208,562	213,058
Texas	411,795	447,231	418,401	481,008
Utah	37,733	66,883	38,975	50,306
Vermont	26,978	32,291	26,245	38,607
Virginia	172,760	211,665	180,025	180,085
Washington	328,589	260,756	334,466	239,146
West Virginia	161,484	208,308	164,874	214,901
Wisconsin	569,687	691,934	562,363	704,770
Wyoming	31,290	20,331	25,691	19,973
Unspecified	3,996	81,004	48,647	774
	17,417,489	19,038,145	18,033,478	18,701,439
Foreign Countries	83,511	74,855	97,522	84,561
Total shipped from cement plants	17,501,000	19,113,000	18,131,000	†18,786,000

*Includes estimated distribution of shipments from three plants in June, 1926, and July, 1925, and from four plants in June, 1925, and July, 1926.
†Revised.

PRODUCTION, SHIPMENTS AND STOCKS OF FINISHED PORTLAND CEMENT, BY MONTHS, IN 1925 AND 1926, IN BARRELS

Month	Production 1925	Production 1926	Shipments 1925	Shipments 1926	Stocks at end of month 1925	Stocks at end of month 1926
January	8,856,000	7,887,000	5,162,000	5,672,000	17,656,000	20,582,000
February	8,255,000	7,731,000	6,015,000	5,820,000	19,689,000	22,384,000
March	11,034,000	10,355,000	10,279,000	9,539,000	20,469,000	23,200,000
First quarter	28,145,000	25,973,000	21,456,000	21,031,000	.....	.....
April	13,807,000	12,401,000	14,394,000	12,961,000	19,877,000	22,640,000
May	15,503,000	16,472,000	16,735,000	17,951,000	18,440,000	21,173,000
June	15,387,000	16,827,000	17,501,000	19,113,000	16,409,000	18,900,000
Second quarter	44,697,000	45,700,000	48,630,000	50,025,000	.....	.....
July	15,641,000	*17,096,000	18,131,000	*18,786,000	13,896,000	*17,210,000
August	16,419,000	16,936,000	18,383,000	18,536,000	11,952,000	15,610,000
September	15,939,000	.....	17,711,000	.....	10,247,000	.....
Third quarter	47,999,000	.....	54,225,000	.....	.....	.....
October	15,992,000	.....	15,309,000	.....	10,979,000	.....
November	13,656,000	.....	10,187,000	.....	14,534,000	.....
December	10,713,000	.....	6,917,000	.....	18,365,000	.....
Fourth quarter	40,361,000	.....	32,413,000	.....	.....	.....
	161,202,000	.....	156,724,000	.....	.....	.....

*Revised.

PRODUCTION, SHIPMENTS AND STOCKS OF FINISHED PORTLAND CEMENT, BY DISTRICTS, IN AUGUST, 1925 AND 1926, AND STOCKS IN JULY, 1926, IN BARRELS

Commercial district	Production 1925—August—1926	Shipments 1925—August—1926	Stocks at end of 1925—August—1926	Stocks at end of July, 1926*
E'n Penn., N. J. & Md.	3,726,000	3,901,000	4,402,000	4,212,000	1,784,000	3,376,000	3,687,000
New York	867,000	936,000	1,001,000	1,086,000	623,000	842,000	992,000
Ohio, W'n Penn. & W. Va.	1,810,000	1,757,000	1,905,000	1,843,000	1,517,000	1,932,000	2,017,000
Michigan	1,192,000	1,508,000	1,285,000	1,806,000	873,000	1,261,000	1,558,000
Wis., Ill., Ind. & Ky.	2,425,000	2,422,000	2,914,000	2,896,000	2,122,000	1,906,000	2,381,000
Va., Tenn., Ala. & Ga.	1,302,000	1,366,000	1,263,000	1,427,000	314,000	1,089,000	1,150,000
E'n Mo., Ia., Minn. & S. Dak.	1,632,000	1,561,000	1,952,000	1,720,000	2,080,000	2,078,000	2,237,000
W'n Mo., Neb., Kans. & Okla.	1,170,000	1,162,000	1,268,000	1,192,000	1,430,000	1,331,000	1,361,000
Texas	481,000	440,000	452,000	494,000	262,000	418,000	472,000
Colo., Mont. & Utah	239,000	309,000	263,000	297,000	409,000	425,000	413,000
California	1,181,000	1,248,000	1,234,000	1,258,000	391,000	518,000	529,000
Ore. & Wash.	394,000	326,000	444,000	305,000	147,000	434,000	413,000
	16,419,000	16,936,000	18,383,000	18,536,000	11,952,000	15,610,000	17,210,000

*Revised.

IMPORTS OF HYDRAULIC CEMENT BY COUNTRIES, AND BY DISTRICTS, IN JUNE, 1926

Imported from	District into which imported	Barrels	Value
Belgium	Connecticut	8,448	$ 13,479
	Galveston	2,240	2,994
	Hawaii	12,499	17,766
	Los Angeles	3,050	3,634
	Maine and New Hampshire	5,999	12,480
	Massachusetts	33,171	50,773
	Mobile	17,360	29,022
	New Orleans	18,730	26,722
	Oregon	14,697	20,649
	Philadelphia	31,443	50,135
	Porto Rico	2,991	4,597
	Washington	13,124	21,370
	Total	163,752	$253,621
Canada	Maine and New Hampshire	226	$ 1,109
	St. Lawrence	930	1,995
	Vermont	369	645
	Total	1,525	$ 3,749
Denmark and Faroe Islands	Porto Rico	25,158	$ 36,249
Esthonia	Florida	25,617	$ 36,510
France	Massachusetts	11,629	$ 18,977
Germany	Michigan	54	$ 77
Japan	Hawaii	2,997	$ 5,776
Soviet Russia in Europe	New York	20,130	$ 41,016
United Kingdom	New York	.....	$ 6
	Grand total	250,862	$395,981

DOMESTIC HYDRAULIC CEMENT SHIPPED TO ALASKA, HAWAII AND PORTO RICO, IN JULY, 1926*

	Barrels	Value
Alaska	1,084	$ 3,273
Hawaii	12,796	32,006
Porto Rico	8,801	16,556
	22,681	$51,835

*Compiled from the records of the Bureau of Foreign and Domestic Commerce and subject to revision.

EXPORTS AND IMPORTS*

EXPORTS OF HYDRAULIC CEMENT BY COUNTRIES, IN JULY, 1926

Exported to	Barrels	Value
Canada	1,677	$ 7,264
Central America	5,573	14,512
Cuba	15,935	38,940
Other West Indies	6,697	14,485
Mexico	17,646	48,877
South America	77,955	216,563
Other countries	5,339	29,579
	130,822	$370,220

EXPORTS AND IMPORTS OF HYDRAULIC CEMENT, BY MONTHS, IN 1925 AND 1926

Month	Exports 1925 Barrels	Exports 1925 Value	Exports 1926 Barrels	Exports 1926 Value	Imports 1925 Barrels	Imports 1925 Value	Imports 1926 Barrels	Imports 1926 Value
January	71,596	$207,547	72,939	$216,431	231,258	$ 364,196	360,580	$576,717
February	56,249	181,356	73,975	220,706	119,077	206,308	314,118	527,948
March	65,248	200,410	69,080	205,647	218,048	337,039	493,241	812,968
April	89,508	263,831	96,296	284,772	197,686	280,826	257,302	398,114
May	85,385	250,845	78,601	224,365	186,897	286,959	223,130	337,031
June	71,343	217,899	80,684	248,814	254,937	409,539	335,570	495,744
July	98,141	286,543	130,822	370,220	335,118	499,602	250,862	395,981
August	103,961	289,904	.....	.....	379,847	611,551	.....	.....
September	102,649	285,225	.....	.....	513,252	789,121	.....	.....
October	73,369	228,467	.....	.....	535,050	824,268	.....	.....
November	101,825	294,201	.....	.....	388,604	678,518	.....	.....
December	100,323	296,900	.....	.....	295,543	526,001	.....	.....
	1,019,597	$3,003,128	.....	.....	3,655,317	$5,813,928	.....	.....

New Georgia Cement Plant Reported

FIVE HUNDRED acres of land between Sandersville and Tennille, Ga., have been purchased for the establishment of a cement plant that will cost approximately $3,000,000, it is announced by the promoters.

The Georgia Portland Cement Co. is the name of the firm promoting the plant. The officers are J. L. Hankinson, president; John C. Hagler, vice president; J. M. Lyons, second vice president; J. C. McAuliffe, secretary, and H. M. Beall, treasurer. All of these men are Augusta, Ga., citizens.

It is stated that the plant will turn out 3,000 to 5,000 bbl. of cement a day and that there is enough material on the tract purchased to keep the plant running for 60 years. The lime rock, which will be utilized, is said to be abundant on the land purchased.

Machinery has been purchased, the firm announces, and will be installed as rapidly as possible.—*Atlanta (Ga.) Constitution.*

Oregon Cement Plants to Be Merged

A MERGER of two large cement plants in Oregon is probably to take place in the near future, as notices have been received by stockholders in the companies concerned outlining the proposed consolidation.

The two firms which would be concerned are the Oregon Portland Cement Co. of Oswego and the Sun Portland Cement Co. on Snake river in eastern Oregon. Shares of the two organizations are said to be largely controlled by the same group, and R. P. Butchart of Victoria, B. C., is president of both companies.

The Oregon Portland operates a single kiln, oil-fired, 210 ft. long and 8 and 10 ft. diam. producing 1150 bbl. per day by the wet process, and the Sun Portland produces about 1200 bbl. per day from a single kiln 210 ft. long and 9½ ft. and 10 ft. diam., coal-fired, using the wet process also.

A considerable increase in capital investment is reported as imminent in the merger which it is indicated will be achieved by selling both properties to a new corporation, the name of which has not yet been made public, but which is to be formed of the group which now has majority control in the two companies. The present capitalization of the Oregon Portland is $1,250,000 and of the Sun Portland $1,250,000.

New Machinery and Equipment

Self-Adjusting Track Brace

FOR holding track better at places where duty is severe and making quick track repairs when necessary, the T. H. Edelblute Co., Pittsburgh, Penn., has developed an appliance known as the "Anchor Track Brace."

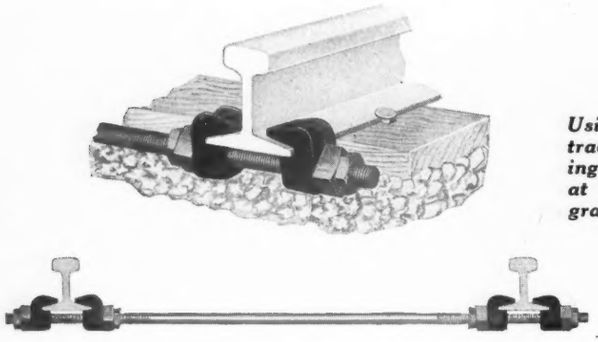
It consists of solid one-piece lugs that hold the base of the rail on both the top and bottom sides. A heavy steel rod, threaded on both ends, connects the two rails, and a square nut is used at each lug to draw it up and hold it. A hexagon lock nut is also used to prevent it from working loose. The lug is very simple, but is also self-adjusting so that the same lug fits equally well on six different weights of rail. At plants where a number of different weights of rail are used, it is necessary only to carry one size of track brace, it is said. This makes a considerable saving in supplies to the operator.

These track braces are said to hold the track to the desired gauge on bad curves, or wherever necessary, and if the track has spread the brace, it is said, will draw it back to proper gauge. They are also said to prevent the rails from turning over; the lifting or crowding of track spikes; and eliminate the expense of re-spiking.

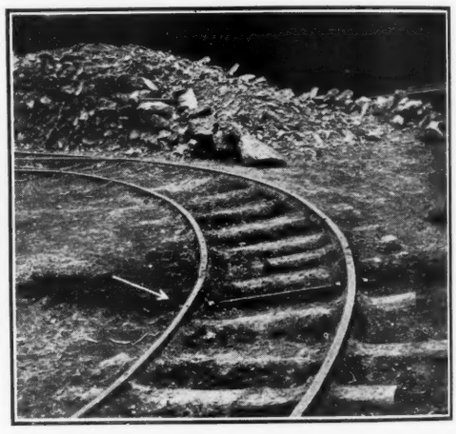
When installed at the point of a switch, the brace, it is said, holds it more rigid, and prevents many of the derailments that are common at switches. At places where the ties have become so rotted that they will not hold spikes, time and expense may be saved by installing a couple of track braces for each rail length, instead of replacing with new ties, the manufacturers claim.

In most cases, when a wreck tears up the track and stops traffic, one man, it is said, with a few track braces can quickly get the track in shape so that it can be used again without much loss of time and at a considerably less cost.

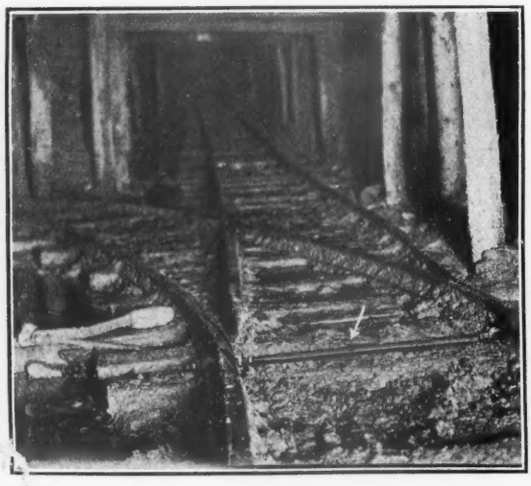
The brace can be installed, it is claimed, in the track by an ordinary workman with a wrench, in four minutes; and can be removed and used over and over again if desired.



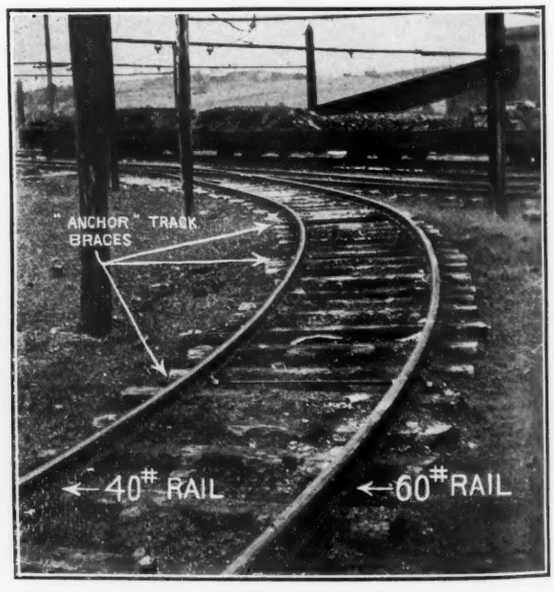
Two detailed views of track brace showing how it is applied to help steady and support the rail in place



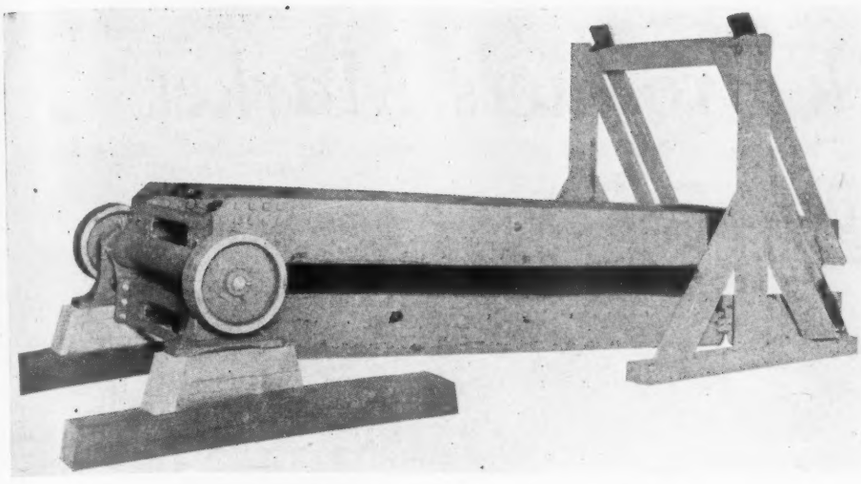
Using the brace to prevent track spreading, rail turning, etc., at a sharp curve at the foot of a steep grade at a western mine



Brace placed near the switch points to check spreading of track; in this particular case it is said that the mud and water so rotted the wood ties that the spikes would not hold the rails properly



Braces used to prevent rails from spreading or turning over on a bad curve at a Pennsylvania mine. Note that the inside track is of 40 lb. and the outside of 60 lb. rail



Double decked screen for separating smaller sizes

Double-Decked Screen

ROBERTS AND SCHAEFER CO., Chicago, Ill., are manufacturing the "Arms" screen for grading coal, which appears to have features that would make it adaptable for use in grading of aggregate in the rock products industries.

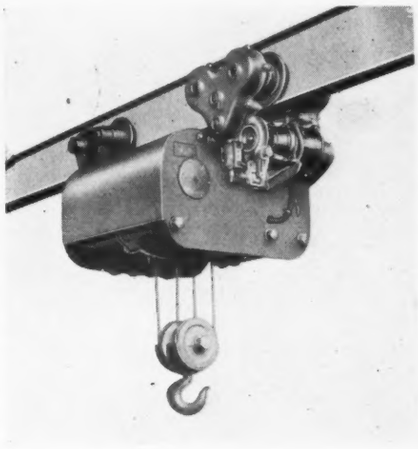
This screen is said to have a very effective motion, capable of breaking up the bed and agitating it uniformly to permit the undersize, even of a size closely approaching that of the aperture, to pass through. Motion is obtained by a ball bearing head of special design capable of standing up under long usage. The shaft runs at 500 r.p.m., about 3 to 5 h.p. being required, it is said.

The screen will convey on a level surface but is usually installed at from 3 to 5 deg. in downward slope. Due to this very slight slope a minimum of head room is required for a battery of these screens. It provides conveying action which helps to distribute the material to the required points for further treatment. With the double deck arrangement the lower decks may be provided with the finest screen cloth used, in this manner multiplying the screen area for the fine sizes which are the most difficult to screen and require the most screening surface.

New Electric Monorail Hoists of Various Capacities

SIX new electrical monorail hoists, ranging in capacities from three to twelve tons, are announced by the American Engineering Co., Philadelphia, Penn., as additions to its line of hoists. Each of the new hoists is made in types for bolt suspension, hand-geared trolley, motor trolley and cab control. Open cabs are provided for indoor use and closed cabs for outdoor service. The hoists can also be supplied with push-button control or remote control. Foundry-type control is provided when desired.

These hoists, which are designated as Class J, "Lo-Hed" electric hoists, embody the same principles of design that characterize the other models of "Lo-Hed" hoists, with such additional features as are made necessary by the higher speeds at which they operate and the heavier loads they are designed to handle. Rated capacities are 3,



New electric monorail hoist

5, 6, 8, 10 and 12 tons, so that the complete "Lo-Hed" line now includes hoists from ½-ton to 12-ton capacity.

In all the hoists the drum and motor are placed on opposite sides of the I-beam track.

New Refractory Cement

THE General Refractories Co., Philadelphia, Penn., announce that they have recently perfected a neutral refractory cement which is of particular advantage as a mortar or protective coat for fire-brick in cement kilns, etc., where coal and ash slags are formed. The basic component of "Grefco," the new cement, is chromite. The use of a chrome base in refractory cements is not new but because of freedom from sodium silicate and other low fusing binders, it is said, the life of such cements is prolonged.

"Grefco," it is said, can be dipped, troweled and worked in the same manner as fine clay mortars. The set is said to be reasonably quick, strong, uniform and the bond made to be constant through all temperatures. The fusion temperature is given at 3,500 deg. F. Briquets made from the cement are said to have shown a tensile strength of 300 lb. per sq. in. after drying and firing.

New Type Poidometer

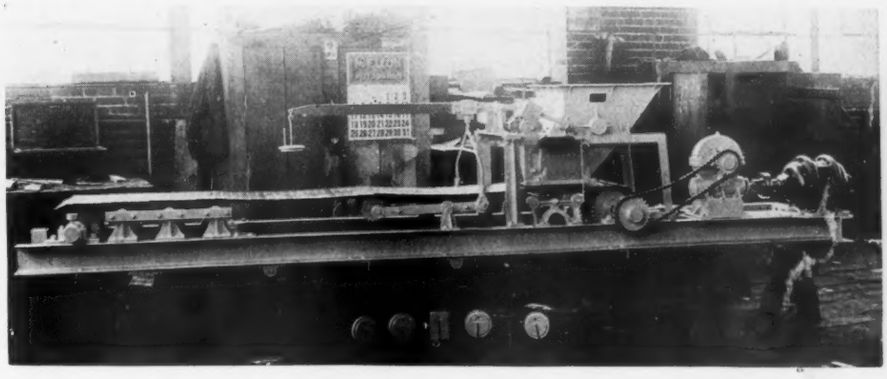
THE Schaffer Poidometer Co., Pittsburgh, Penn., have recently placed a new type of Poidometer on the market. This machine is being sold to handle such material as hot clinker, stone, coke and other sharp and abrasive materials.

In place of the rubber belt and pulleys the new machine is equipped with cold rolled steel flights mounted on two strands of high grade 1 in. pitch steel roller chain, which operates over cut tooth sprockets.

One of the largest cement companies in the East has recently installed this machine in its newest plant to handle hot clinker and another cement company has five in use in handling hot clinkers, gypsum and limestone.

These machines are manufactured in two widths. The 20-in. width is rated by the manufacturers at a capacity of 40 tons per hour on such materials as stone and clinker, provided it is crushed to 1½-in. and finer; and the 36-in. width has a rated capacity of 150 tons per hour on the same material, provided it is crushed to 4-in. and finer.

The new type Poidometer as well as the old type now is being equipped with a new style Productimeter mounted on the side of the hopper, which gives the operator a clearer view of the amount of material handled in any given unit of time.



View of new type poidometer for handling hot clinker, stone and other materials

The Rock Products Market

Wholesale Prices of Crushed Stone

Prices given are per ton, F.O.B., at producing point or nearest shipping point

Crushed Limestone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
EASTERN:						
Buffalo, N. Y.	1.30	1.30	1.30	1.30	1.30	1.30
Chaumont, N. Y.	.50	1.75	1.75	1.50	1.50	1.50
Chazy, N. Y.	.75	1.65	1.65	1.40	1.40	1.40
Cobleskill, N. Y.	1.50	1.35	1.25	1.25	1.25	.....
Danbury, Conn.	1.50@2.00	2.00	1.75	1.50	1.35	1.25
Dundas, Ont.	.53	1.05	1.05	.90	.90	.90
Frederick, Md.	.50@ .75	1.20@1.30	1.15@1.25	1.10@1.15	1.10@1.15	1.05@1.10
Munns, N. Y.	1.00	1.40	1.40	1.25	1.25	.....
Northern New Jersey	1.60	1.50@1.80	1.30@2.00	1.40@1.60	1.40@1.60	.....
Prospect, N. Y.	1.00	1.50	1.40	1.30	1.30	.....
Walford, Penn.	.....	.....	1.35h	1.35h	1.35h	1.35h
Watertown, N. Y.	1.00	.....	1.75	1.50	1.50	1.50
Western New York	.85	1.25	1.25	1.25	1.25	1.25
CENTRAL						
Afton, Mich.	.....	.....	.50	.....	.....	1.50
Alton, Ill.	1.85	.....	1.85	.....	.....	.....
Bloomville, Middlepoint, Dunkirk, Bellevue, Waterville, No. Baltimore, Holland, Kenton, New Paris, Ohio; Monroe, Mich.; Huntington, Bluffton, Ind.	1.00	1.10	1.10	1.00	1.00	1.00
Buffalo and Linwood, Iowa	1.00	.....	1.10	.90	.95	.95
Carey, Ohio	1.05	1.05	1.05	1.05	1.05	1.05
Chasco, Ill.	1.00@1.30	.....	1.00@1.15	.....	1.00@1.15	.....
Columbia and Krause, Ill.	1.00@1.50	.90@1.10	1.20@1.35	1.00@1.20	.90@1.20	.....
			Flux 1.50@1.75			
Greencastle, Ind.	1.30	1.25	1.15	1.05	.95	.95
Lannon, Wis.	.80	.80	1.00	1.00	.90	.90
McCook, Ill.	1.00	1.25	1.25	1.25	1.25	1.25
Milltown, Ind.	.....	90@1.10	.90@1.15	.90@1.00	.85@.90	.85@.90
River Rouge, Mich.	1.20	1.20	1.20	1.20	1.20	1.20
St. Vincent de Paul, Que.	.75	1.20@1.45	.90@1.15	.90@ .95	.85	.85
Sheboygan, Wis.	1.10	1.10	1.10	1.10	1.10	.....
Toledo, Ohio	1.60	1.70	1.70	1.60	1.60	1.60
Toronto, Ont.	1.50	2.00	2.00	1.85	1.85	1.85
Stone City, Iowa	.75	.....	†1.10	1.05	1.00	.....
Waukesha, Wis.	1.10	.....	.90	.90	.90	.90
SOUTHERN:						
Alderson, W. Va.	.50	1.35	1.35	1.25	1.20	1.15
Brooksville, Fla.	.75	.....	2.65	2.65	2.40	2.00
Cartersville, Ga.	1.50	1.50	1.50	1.35	1.25	1.15
Chico, Texas	1.00	1.35	1.35	1.25	1.15	1.00
El Paso, Tex.	1.00	1.00	1.00	1.00	.....	.....
Ft. Springs, W. Va.	.50	1.60	1.50	1.35	1.25	.....
Graystone, Ala.			Crusher run, 1.00 per ton			
Kendrick and Santos, Fla.			3½ in. and less, 1.00 per ton			
New Braunfels, Tex.	.30@1.00	1.00@1.30	1.00@1.30	.70@1.00	.70@ .90	.....
Olive Hill, Ky.	.50@1.00‡	1.00	1.00	1.00	1.00	1.00
Rocky Point, Va.	.50@1.00	1.40@1.60	1.30@1.40	1.15@1.35	1.10@1.20	1.00@1.05
WESTERN:						
Atchison, Kans.	.25	1.90	1.90	1.90	1.90	1.80
Blue Springs & Wymore, Neb.	.25	1.45	1.45	1.35c	1.25d	1.20
Cape Girardeau, Mo.	1.25	.....	1.25	1.25	1.10	.....
Kansas City, Mo.	.75	1.50	1.50	1.50	1.50	1.50
Rock Hill, St. Louis Co., Mo.	1.45	1.45	1.45	1.45	1.35	1.35

Crushed Trap Rock

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Branford, Conn.	.80	1.70	1.45	1.20	1.05	.....
Duluth, Minn.	.90	2.25	1.90	1.50	1.35	1.35
Dwight, Calif.	1.00	1.00	1.00	.90	.90	.....
Eastern Maryland	1.00	1.60	1.60	1.50	1.35	1.35
Eastern Massachusetts	.85	1.75	1.75	1.25	1.25	1.25
Eastern New York	.75	1.25	1.25	1.25	1.25	1.25
Eastern Pennsylvania	1.10	1.70	1.60	1.50	1.35	1.35
Knippa, Texas	2.50	2.00	1.55	1.25	1.15	1.15@1.50
New Haven, New Britain, Meriden & Wallingford, Conn.	.80	1.70	1.45	1.20	1.05	.....
Northern New Jersey	1.40	1.40	1.80	1.40	1.40	.....
Oakland and El Cerito, Cal.	1.00	1.00	1.00	.90	.90	.....
San Diego, Calif.	.....	2.75	2.55	2.35	2.35	.....
Sheboygan, Wis.	1.00	1.10	1.10	1.10	1.10	.....
Springfield, N. J.	1.75	2.10	2.10	1.70	1.60	1.60
Toronto, Ont.	.....	3.53@4.00	.....	3.00@3.75	.....	.....
Westfield, Mass.	.60	1.50	1.35	1.20	1.10	.....

Miscellaneous Crushed Stone

City or shipping point	Screenings, ¼ inch down	½ inch and less	¾ inch and less	1½ inch and less	2½ inch and less	3 inch and larger
Berlin, Utley, Montello and Red Granite, Wis.—Granite	1.80	1.70	1.50	1.40	1.40	.....
Coldwater, N. Y.—Dolomite			1.50 all sizes			
Columbia, S. C.	.75	2.00	1.75	1.75	1.60	1.60
Eastern, Penn.—Sandstone	1.35	1.70	1.65	1.40	1.40	1.40
Eastern Penn.—Quartzite	1.20	1.35	1.25	1.20	1.20	1.20
Lithonia, Ga.	.75	1.75b	1.75	1.40	1.40	.....
Lohrville, Wis.—Granite	1.65	1.70	1.65	1.45	1.50	.....
Middlebrook, Mo.	3.00@3.50	.....	2.00@2.25	2.00@2.25	.....	1.25@3.00
Richmond, Calif.—Quartzite	.75	.....	1.00	1.00	1.00	.....
Somerset, Pa. (sand rock)	1.85@2.00a	.....	1.35@1.50	.....	1.00@1.50	.....
Toccoa, Ga.	.....	1.35	.....	1.30	1.30	1.25

*Cubic yd. †1 in. and less. ‡Two grades. ‖Rip rap per ton. (a) Sand. (b) to ⅛ in. (c) 1 in., 1.40. (d) 2 in., 1.10 (e) Dust. (f) ¼ in. (h) less 10c discount. (i) 1 in., 1.40.

Agricultural Limestone

(Pulverized)

Alderson, W. Va.—50% thru 50 mesh	1.50
Alton, Ill.—Analysis 99% $CaCO_3$, 0.3% $MgCO_3$; 90% thru 100 mesh	6.00
Asheville, N. C.—Analysis, 57% $CaCO_3$, 39% $MgCO_3$; 50% thru 100 mesh; 200-lb. burlap bag, 4.00; bulk	2.75
Atlas, Ky.—90% thru 100 mesh	2.00
50% thru 100 mesh	1.00
Belfast and Rockland, Me. (rail), Lincolnville, Me. (water), analysis $CaCO_3$ 90.04%; $MgCO_3$ 1.5%, 100% thru 14 mesh, bags	4.50
Bulk	3.50
Bettendorf and Moline, Ill.—Analysis, $CaCO_3$, 97%; 2% $MgCO_3$; 50% thru 100 mesh, 1.50; 50% thru 4 mesh	1.50
Branchton and Osborne, Penn.—100% thru 20 mesh; 60% thru 100 mesh; 45% thru 200 mesh. (Less 50 cents commission to dealers)	5.00
Cape Girardeau, Mo.—Analysis, 93% $CaCO_3$, 3.5% $MgCO_3$; pulverized; 50% thru 50 mesh	1.50
Cartersville, Ga.—Pulverized, 2.00; 50% thru 50 mesh	1.50
Chaumont, N. Y.—Pulverized limestone, bags, 4.00; bulk	2.50
Chico, Texas.—50% thru 50 mesh, bulk	1.50
Colton, Calif.—Analysis 90% $CaCO_3$, bulk	4.00
Cypress, Ill.—90% thru 100 mesh	1.35
Hillsville, Penn.—Analysis, 94% $CaCO_3$, 1.40% $MgCO_3$; 75% thru 100 mesh; sacked	5.00
Jamesville, N. Y.—Analysis, 89.25% $CaCO_3$; 5.25% $MgCO_3$; pulverized, bags, 4.25; bulk	2.75
Joliet, Ill.—90% thru 100-mesh	4.25
Knoxville, Tenn.—80% thru 200 mesh, 3.00; 80% thru 100 mesh, bags, 3.95; bulk	2.70
Marblehead, Ohio—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$; 60% thru 100 mesh; 70% thru 50 mesh; 100% thru 10 mesh; 80 lb. paper sacks, 5.00; bulk	3.50
Marion, Va.—Analysis, 90% $CaCO_3$, pulverized, per ton	2.00
Mayville, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 90% thru 100 mesh	3.90@ 4.50
Milltown, Ind.—Analysis, 94.50% $CaCO_3$, 33% thru 50 mesh, 40% thru 50 mesh; bulk	1.35@ 1.60
Olive Hill, Ky.—50% thru 50 mesh, 2.00; 90% thru 4 mesh	1.00
Piqua, Ohio—Total neutralizing power 95.3%; 99% thru 10, 60% thru 50; 50% thru 100	2.50@ 2.75
100% thru 10, 90% thru 50, 80% thru 100; bags, 5.10; bulk	3.60
99% thru 100, 85% thru 200; bags, 7.00; bulk	5.50
Rocky Point, Va.—Analysis, $CaCO_3$, 95%; $MgCO_3$, 0.75%; 50% thru 100 mesh, burlap bags, 3.50; paper, 3.25; bulk	2.00
Syracuse, N. Y.—Analysis, 89% $CaCO_3$; $MgCO_3$, 4%; bags, 4.25; bulk	2.75
Toledo, Ohio, 30% through 50 mesh	2.25
Waukesha, Wis.—90% thru 100 mesh, 4.50; 50% thru 100 mesh, 2.10; 90% thru 50 mesh	1.65
Watertown, N. Y.—Analysis, 96-99% $CaCO_3$; 50% thru 100 mesh; bags, 4.00; bulk	2.50
West Stockbridge, Mass.—Analysis 90% $CaCO_3$, 50% thru 100 mesh; cloth bags, 4.75; paper, 4.25; bulk	3.25

Agricultural Limestone

(Crushed)

Alton, Ill.—Analysis 99% $CaCO_3$, 0.3% $MgCO_3$; 50% thru 4 mesh	3.00
Atlas, Ky.—50% thru 4 mesh	.50
Bedford, Ind.—Analysis, 98.5% $CaCO_3$, 0.5% $MgCO_3$; 90% thru 10 mesh	1.50
Brandon and Middlebury, Vt.—Pulverized, bags, 5.50; bulk	3.50

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Agricultural Limestone

Bridgeport and Chico, Texas—Analysis, 94% $CaCO_3$, 2% $MgCO_3$; 100% thru 10 mesh 1.75
50% thru 4 mesh 1.50
Chasco, Ill.—50% thru 100 mesh 1.20
Chicago, Ill.—50% thru 100 mesh; 90% thru 4 mesh ..... .80
Columbia, Krause, Valmeyer, Ill.—Analysis, 90% $CaCO_3$; 90% thru 4 mesh 1.35
Cypress, Ill.—90% thru 50 mesh, 50% thru 100 mesh, 90% thru 50 mesh, 90% thru 4 mesh, 50% thru 4 mesh 1.35
Danbury, Conn.—Analysis, 81 to 85% $CaCO_3$ ..... 3.75@ 4.75
Dundas, Ont.—Analysis, 53.8% $CaCO_3$; $MgCO_3$, 43.3%. 100% thru 10 mesh, 40% thru 50 mesh, 25% thru 100 mesh 1.00
Ft. Springs, W. Va.—Analysis, 90% $CaCO_3$; 90% thru 50 mesh 1.50
Garnet, Okla.—All sizes 1.25
Kansas City, Mo.—50% thru 100 mesh ..... .75
Lannon, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 99% through 10 mesh; 46% through 60 mesh 2.00
Screenings (¼ in. to dust) 1.00
Marblehead, Ohio.—Analysis, 83.54% $CaCO_3$, 14.92% $MgCO_3$, 32% thru 100 mesh; 51% thru 50 mesh; 83% thru 10 mesh; 100% thru 4 mesh (meal) bulk 1.60
Mayville, Wis.—Analysis, 54% $CaCO_3$, 44% $MgCO_3$; 50% thru 50 mesh .... 1.85@ 2.35
McCook, Ill.—90% thru 4 mesh ..... .90
Middlepoint, Bellevue, Kenton, Ohio; Monroe, Mich.; Huntington and Bluffton, Ind.—Analysis, 42% $CaCO_3$, 54% $MgCO_3$; meal, 25 to 45% thru 100 mesh 1.60
Moline, Ill., and Bettendorf, Iowa—Analysis, 97% $CaCO_3$, 2% $MgCO_3$; 50% thru 100 mesh; 50% thru 4 mesh 1.50
Monroe, Mich. — Analysis, $CaCO_3$, 52.03%; 42.25% $MgCO_3$; 30% thru 100 mesh 2.30
Mountville, Va. — Analysis, 62.54% $CaCO_3$; $MgCO_3$, 35.94%, 100% thru 20 mesh; 50% thru 100 mesh bags 5.50
Pixley, Mo.—Analysis, 96% $CaCO_3$; 50% thru 50 mesh 1.25
50% thru 100 mesh; 90% thru 50 mesh; 50% thru 50 mesh; 90% thru 4 mesh; 50% thru 4 mesh 1.65
River Rouge, Mich.—Analysis, 54% $CaCO_3$, 40% $MgCO_3$; bulk ..... .80@ 1.40
Stone City, Iowa. — Analysis, 98% $CaCO_3$; 50% thru 50 mesh ..... .75
Tulsa, Okla.—Analysis $CaCO_3$, 86.15%, 1.25% $MgCO_3$, all sizes 1.25

Pulverized Limestone for Coal Operators

Hillsville, Penn., sacks, 4.50; bulk 3.00
Joliet, Ill.—90% thru 200 mesh 4.00
Piqua, Ohio, sacks, 4.50@5.00 bulk .... 3.00@ 3.50
Rocky Point, Va.—80% thru 200 mesh, bulk 3.00
Waukesha, Wis.—90% thru 100 mesh, bulk 4.50

Glass Sand

Silica sand is quoted washed, dried and screened unless otherwise stated. Prices per ton f.o.b. producing plant.

Berkeley Springs, W.Va.—Glass sand .. 2.25
Buffalo, N. Y. ..... 2.00@ 2.50
Cedarville and S. Vineland, N. J.—
Damp 1.75
Dry 2.25
Columbus, Ohio ..... 1.00@ 1.50
Estill Springs and Sewanee, Tenn. 1.50
Franklin, Penn. 2.00
Gray Summit and Klondike, Mo. ..... 1.75@ 2.00
Los Angeles, Calif.—Washed 5.00
Mapleton Depot, Penn. ..... 2.00@ 2.25
Massillon, Ohio 3.00
Mendota, Va. ..... 2.25@ 2.50
Mineral Ridge and Ohlton, Ohio 2.50
Oceanside, Calif. 3.00
Ottawa, Ill. ..... .75@ 1.25
Pittsburgh, Penn. ..... 3.00@ 4.00
Ridgway, Penn. 2.50
Rockwood, Mich. ..... 2.75@ 3.25
Round Top, Md. 2.00
San Francisco, Calif. ..... 4.00@ 5.00
St. Louis, Mo. 2.00
Sewanee, Tenn. 1.50
Thayers, Penn. 2.50
Utica, Ill. ..... 1.00@ 1.25
Zanesville, Ohio 2.50

Miscellaneous Sands

City or shipping point	Roofing sand	Traction
Beach City, Ohio		1.50@ 1.75
Columbus, Ohio		.30@ 1.50
Dresden, Ohio		1.00
Eau Claire, Wis.	4.25	.60@ 1.00
Estill Springs and Sewanee, Tenn.	1.35@ 1.50	1.35@ 1.50

(Continued on next page)

Wholesale Prices of Sand and Gravel

Prices given are per ton, F.O.B., producing plant or nearest shipping point

Washed Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel 2 in and less
EASTERN:						
Ambridge & So. H'g'ts, Penn.	1.25	1.25	1.15	.85	.85	.85
Attica and Franklinville, N. Y.	.75	.75	.75	.75	.75	.75
Boston, Mass.‡	1.40	1.40	2.25		2.25	2.25
Buffalo, N. Y.	1.10	.95			.85	
Erie, Pa.		1.00*		1.50*	1.75*	
Farmingdale, N. J.	.48	.48	.75	1.20	1.10	
Hartford, Conn.	.65*					
Leeds Junction, Me.		.50	1.75		1.35	1.25
Machias Jct., N. Y.		.75	.75		.75	
Montoursville, Penn.		1.00	.75	.75	.75	.75
Northern New Jersey	.40@ .50	.40@ .50	1.25	1.25	.90@1.25	
Olean, N. Y.		.75	.75		.75	
Portland, Me.	1.50	1.50	2.75		2.50	
Shining Point, Penn.			1.00	1.00	1.00	1.00
Somerset, Penn.		1.85@2.00				
South Heights, Penn.	1.25	1.25	.85	.85	.85	.85
Washington, D. C.	.60@ .85	.60@ .85	1.70	1.50	1.30	1.30
CENTRAL:						
Algonquin and Beloit, Wis.	.50	.40	.60	.60	.60	.60
Appleton and Mankato, Minn.		.45	1.25	1.25	1.25	1.25
Attica, Ind.			All sizes .75@.85			
Aurora, Oregon, Sheridan, Moronts, Yorkville, Ill.	.60	.50	.40	.50	.60	.55
Barton, Wis.		.75		.75	.75	.85
Chicago, Ill.	.70	.60	.50	.60	.60	.60
Columbus, Ohio		.70	.70	.70	.70	
Des Moines, Iowa		.40	1.50			
Eau Claire, Wisc.	.60@1.25	.45	.85@1.25	.95	.95	
Elgin, Ill.		.20*	.50*	1.50*	1.50*	1.50*
Elkhart Lake, Wisc.	.50	.40	.40	.56	.40	.40
Ferrysburg, Mich.		.50@ .80	.60@1.00	.60@1.00		.50@1.25
Ft. Dodge, Iowa	.85	.85	2.05	2.05	2.05	2.05
Ft. Worth, Texas	2.00	2.00	2.00	2.00	2.00	2.00
Grand Haven, Mich.		.60@ .70		.70@ .90		.70@ .90
Grand Rapids, Mich.		.50		.80	.80	.70
Hamilton, Ohio		1.00			1.00	
Hersey, Mich.		.50				.70
Humboldt, Iowa	.50	.50	1.50	1.50	1.50	1.50
Indianapolis, Ind.	.60	.60		.90	.75@1.00	.75@1.00
Joliet, Plainfield and Hammond, Ill.	.60	.50	.50	.60	.60	.60
Mason City, Iowa	.50	.50	1.45	1.45	1.45	1.35
Mattoon, Ill.	.75	.75	.75	.75	.75	.75
Milwaukee, Wis.		1.01	1.21	1.21	1.21	1.21
Moline, Ill.	.60@ .85	.60@ .85	1.00@1.20	1.00@1.20	1.00@1.20	1.00@1.20
Northern New Jersey	.50	.50	1.50	1.25	1.25	
Palestine, Ill.	.75	.75	.75	.75	.75	.75
Pittsburgh, Penn.	1.25	1.25	.85	.85	.85	.85
Silverwood, Ind.	.75	.75	.75	.75	.75	.75
St. Louis, Mo.	.93	1.45	1.55a	1.45	1.45	1.45
Terre Haute, Ind.	.75	.60	.90	.75	.75	.75
Wolcottville, Ind.	.75	.75	.75	.75	.75	.75
Waukesha, Wis.		.45	.60	.60	.65	.65
Winona, Minn.	.40	.40	1.50	1.10	1.10	1.10
Zanesville, Ohio		.60	.50	.60	.80	
SOUTHERN:						
Charleston, W. Va.			All sand, 1.40.	All gravel, 1.50.		
Chattanooga, Tenn.		1.65			1.45	
Chattahoochie River, Fla.		.70		1.75		
Eustis, Fla.		.60@ .70				
Knoxville, Tenn.	1.00	1.00	1.20	1.20	1.20	1.00
Lindsay, Texas					.55	
Macon, Ga.		.50	.50			
New Martinsville, W. Va.	1.00	.90@1.00		1.30		.80@ .90
Roseland, La.	.50	.50	2.50	1.35	1.10	1.10
WESTERN:						
Kansas City, Mo.	1.00	.70				
Los Angeles district (bunkers)†	1.50	1.40	1.85	1.85	1.85	1.85
Phoenix, Ariz.	1.25*	1.25*	2.25@2.50*	2.00*	1.75*	1.50*
Pueblo, Colo.	.80	.65		1.35		1.20
San Diego, Calif.	.65@ .75	.65@ .75	1.50	1.30	1.10	1.10
Seattle, Wash. (bunkers)	1.25*	1.25*	1.25*	1.25*	1.25*	1.25*

Bank Run Sand and Gravel

City or shipping point	Fine Sand, 1/10 in. down	Sand, ¼ in. and less	Gravel, ½ in. and less	Gravel, 1 in. and less	Gravel, 1½ in. and less	Gravel, 2 in. and less
Algonquin and Beloit, Wis.			Dust to 3 in., .40			
East Hartford, Conn.			Sand, .75*			
Ferrysburg, Mich.						.65@1.00
Gainesville, Texas						.55
Grand Haven, Mich.						.70@ .90
Grand Rapids, Mich.				.60		
Hamilton, Ohio					.70	
Hersey, Mich.				.50		
Indianapolis, Ind.			Mixed gravel for concrete work, at .65			
Joliet, Plainfield and Hammond, Ill.	.35	1.25				
Lindsay, Texas						.55
Macon, Ga.	.35	.35				
Mankato, Minn.			Pit run sand, .70			
Moline, Ill. (b)	.60	.60	Concrete gravel, 50% G., 50% S., 1.00			
Ottawa, Oregon, Moronts and Yorkville, Ill.			Ave. .60 per ton all sizes			
Somerset, Penn.		1.85@2.00		1.50@1.75		
St. Louis, Mo.			Mine run gravel, 1.55 per ton			
Shining Point, Penn.			Concrete sand, 1.10 ton			
Summit Grove, Ind.	.50	.50	.50	.50	.50	.54
Winona, Minn.	.60	.60	.60	.60	.60	.60
York, Penn.	1.10	1.00				

(a) ⅝ in. down. (b) River run. (c) 2½ in. and less.
*Cubic yd. †Include freight and bunkerage charges and truck haul. ‡Delivered on job.
(d) Less 10c per ton if paid E.O.M. 10 days. (e) pit run. (f) plus 15c winter loading charge.

Core and Foundry Sands

Silica sand is quoted washed, dried and screened unless otherwise stated. Prices per ton f.o.b. producing plant.

City or shipping point	Molding, fine	Molding, coarse	Molding, brass	Core	Furnace lining	Sand blast	Stone sawing
Aetna, Ill.				.30@ .35			
Albany, N. Y.	2.00	2.00	2.25			3.75	
Arenzville, Ill.	1.50@1.75			1.00			
Beach Sity, Ohio	1.75@2.00	1.75@2.00		1.75@2.25	1.75@2.50		
Buffalo, N. Y.	1.50	1.50		2.00@2.50			
Columbus, Ohio	1.25@2.00	1.25@1.75	2.00@2.50	.30@1.50	2.00@2.50	2.75@3.50	1.50@3.00
Dresden, Ohio	1.40	1.50	1.50	1.25	1.50		
Eau Claire, Wis.						3.00	
Elco, Ill.	Ground silica per ton in carloads—18.00@31.00						
Elnora, N. Y.			1.75				
Estill Springs and Sewanee, Tenn.	1.25			1.25		1.35@1.50	
Franklin, Penn.	1.75	1.75	2.00	1.75			
Kasota, Minn.							1.10a
Klondike, Mo.	1.75		1.75	1.75	1.75		1.75
Mapleton Depot, Pa.	2.00	2.00		2.00		2.00@2.25	
Massillon, Ohio	2.50	2.50		2.50	2.50		
Mendota, Va.	Ground flint or silex—16.00@20.00 per ton						
Michigan City, Ind.				.20@ .30	.30		
Montoursville, P'n.				1.25@1.35			
New Lexington, O.	2.00	1.50					
Ohlton, Ohio	1.80	1.80	1.80	2.00	1.80	1.80	1.80
Ottawa, Ill.	2.50		2.50	1.25	.75	3.50	3.50
Red Wing, Minn.	1.25		1.25	1.50	1.50	3.50	1.50
Ridgeway, Penn.	1.50	1.50					
Round Top, Md.		1.25		1.60		2.25	
San Francisco, Calif.	3.50	4.75	3.50	3.50@5.00	3.50@4.50	3.50@5.00	
Tamalco, Ill.		1.40@1.60					
Tamms, Ill.	Ground silica per ton in carloads—20.00@31.00						
Thayers, Penn.	1.25	1.25		2.00			
Utica, Ill.¶		.50@.85	.50@.90	.60@.75	.60@.90		
Utica, Ill.	.60	.65@ .85		.65	.75		
Utica, Penn.	1.75	1.75		2.00			
Zanesville, Ohio	2.00	1.50	2.00	2.00	2.00		

*Green. †Crude silica, crushed and screened, not washed or dried. ‡Plus 75c per ton for winter loading. ¶Crude. §Crude and dry. (a) delivered.

Crushed Slag

City or shipping point EASTERN:	Roofing	¼ in. down	½ in. and less	¾ in. and less	1½ in and less	2½ in. and less	3 in. and larger
Buffalo, N. Y., Emporium nd Dubois, Pa.	2.25	1.25	1.25	1.25	1.25	1.25	1.25
Eastern Penn.	2.50	1.20	1.50	1.20	1.20	1.20	1.20
Northern, N. J.	2.50	1.25	1.50	1.25	1.25	1.25	1.25
Reading, Pa.	2.50	1.00		1.25			
Western Penn.	2.50	1.25	1.50	1.25	1.25	1.25	1.25
CENTRAL:							
Ironton, Ohio	2.05*	1.30*	1.80*	1.45*	1.45*	1.45*	1.45*
Jackson, Ohio		1.05*		1.30*	1.05*	1.30*	1.30*
Toledo, Ohio	1.50	1.35	1.35	1.35	1.35	1.35	1.35
Youngst'n, O., dist.	2.00	1.25	1.35	1.35	1.25	1.25	1.25
SOUTHERN:							
Ashland, Ky.		1.55*		1.55*	1.55*	1.55*	1.55*
Ensley and Alabama City, Ala.	2.05	.80	1.35	1.25	.90	.90	.80
Longdale, Roanoke, Ruessens, Va.	2.50	1.00	1.25	1.25	1.25	1.15	1.15
Woodward, Ala.	2.05*	.80*	1.35*	1.25*	.90*	.90*	

*5c per ton discount on terms.

Lime Products (Carload Prices Per Ton F.O.B. Shipping Point)

	Finishing hydrate	Masons' hydrate	Agricultural hydrate	Chemical hydrate	Ground burnt lime, Blk.	Ground burnt lime, Bags	Lump lime. Blk.	Lump lime. Bbl.
EASTERN:								
Berkeley, R. I.			12.00					2.15e
Buffalo, N. Y.		12.00	12.00	12.00			10.00	1.95d
Chazy, N. Y.	12.50	10.50	8.00	12.00	11.50	16.50	10.00	2.50₂
Lime Ridge, Penn.					5.00a			
West Stockbridge, Mass.	12.00	10.00	5.60					2.00t
Williamsport, Penn.			10.00				6.00	
York, Penn.		9.50	9.50	10.50	8.50	10.50	8.50	1.65i
CENTRAL:								
Carey, Ohio	12.50	8.50	8.00		9.00		8.50	2.00
Cold Springs, Ohio	12.50	8.50	8.50		9.00		8.00	
Delaware, Ohio		8.50	8.50	8.50	7.50	.67½	7.50	1.50
Frederick, Md.		10.00	10.00	10.00	8.50	10.00	7.00	
Gibsonburg, Ohio	12.50	8.50	8.50		9.00	11.00	8.50	
Huntington, Ind.	12.50	8.50	8.50		9.00		8.00	
Luckey, Ohio	12.50							
Marblehead, Ohio		8.50	8.50		9.00		8.00	1.50w
Marion, Ohio		8.50	.850				8.00	1.70d
Milltown, Ind.		9.00@10.00		10.00p			8.50q	1.40r
Sheboygan, Wis.	11.50						9.50	.95
Tiffin, Ohio					9.00			
White Rock, Ohio	12.50				9.00	11.00	8.00	
Wisconsin points (f)		11.50					9.50	
Woodville, Ohio	12.50	8.50	8.50	13.50	9.00	11.00	9.00	1.50c
SOUTHERN:								
Allgood, Ala.	12.50	10.00			8.50		8.50	1.50
El Paso, Tex.	22.50						8.00	
Graystone, Ala.	12.50	10.00				1.45e	8.50	1.50
Keystone, Ala.		10.00	10.00	10.00	8.50	1.45u	8.50	1.50
Knoxville, Tenn.	20.25	10.00	10.00	10.00			8.50	1.50
Longview, Ala.	12.50	10.00	9.00	10.00			8.50	1.50
Ocala, Fla.	14.00	13.00	12.00	13.00			12.00	1.70
Saginaw, Ala.	12.50	10.00	9.00	10.00			8.50	1.50
WESTERN:								
Calcite, Colo.							9.25	
Cirdland, N. M.							15.00	
Limestone, Wash.	15.00	15.00	10.00	15.00	16.50	16.50	16.50	2.09
Dittlinger, Tex.		12.00@13.00					9.50p	1.50₄
San Francisco, Calif.	21.00	19.00	16.50				14.00	2.00
Tehachapi, Calif.			8.00				13.00z	2.20x
Seattle, Wash.	19.00	19.00	12.00	19.00	19.00		18.60	2.30

†50-lb. paper bags; (a) run of kilns; (c) wooden, steel 1.70; (d) steel; (e) per 180-lb. barrel: (f) dealers' prices, net 30 days less 25c disc. per ton on hydrated lime and 5c per bbl. on lump if paid in 10 days; (i) 180-lb. net barrel, 1.65; 280-lb. net barrel, 2.65; (p) to 11.00; (q) to 8.75; (r) to 1.50; (s) in 80-lb. burlap sacks; (t) to 3.00; (u) two 90-lb. bags; (v) oil burnt; wood burnt 2.25@2.50; (x) wood, steel 2.30; (z) to 15.00; (*) quoted f.o.b. New York; (‡) paper bags; (w) to 1.50 in two 90-lb. bags, wood bbl. 1.60; (1) to 10.00; (3) 80-lb. paper bags; (2) to 3.00; (3) to 9.00; (4) to 1.60. (5) to 16.00; (6) wood bbl., steel, 1.80.

Miscellaneous Sands

(Continued)

City or shipping point	Roofing sand	Traction
Gray Summit and Klondike, Mo.		1.75
Mapleton Depot, Penn.	2.00	2.00
Massillon, Ohio		2.25
Michigan City, Ind. (Engine sand)		.15@ .25
Mineral Ridge, Ohio	*1.75	*1.75
Montoursville, Penn.		1.25
Ohlton, Ohio	1.80	1.80
Ottawa, Ill.	1.25	
Red Wing, Minn.		1.25
Round Top, Md.	2.25	1.75
San Francisco, Calif.	3.50@ 4.50	3.50@ 4.50
Thayers, Penn.		2.25
Utica, Ill.	1.00@ 3.00	1.00
Warwick, Ohio		2.25
Zanesville, Ohio		2.50

*Wet.

Talc

Prices given are per ton f.o.b. (in carload lots only), producing plant, or nearest shipping point,

Baltimore, Md.:	
Crude talc (mine run)	3.00@ 4.00
Ground talc (20-50 mesh), bags	10.00
Cubes	55.00
Blanks (per lb.)	.08
Pencils and steel worker's crayons, per gross	1.00@ 1.50
Chatsworth, Ga.:	
Crude Talc	5.00
Ground (150-200 mesh), bulk	10.00
Pencils and steel worker's crayons, per gross	1.00@ 2.00
Chester, Vt.:	
Ground talc (150-200 mesh), bulk	9.00@10.00
Including bags	10.00@11.00
Chicago and Joliet, Ill.:	
Ground (150-200 mesh), bags	30.00
Dalton, Ga.:	
Crude talc	5.00
Ground talc (150-200) bags	10.00@12.00
Pencils and steel workers' crayons, per gross	1.00@ 1.50
Emeryville, N. Y.:	
(Double air floated) including bags;	
325 mesh	14.75
200 mesh	13.75
Hailesboro, N. Y.:	
Ground white talc (double and triple air floated) including bags, 300-350 mesh	15.50@20.00
Henry, Va.:	
Crude (mine run)	3.50@ 4.50
Ground talc (150-200 mesh), bulk	9.00@14.50
Joliet, Ill.:	
Roofing talc, bags	10.00
Ground talc (200 mesh), bags	30.00
Keeler, Calif.:	
Ground (200-300 mesh), bags	20.00@30.00
Natural Bridge, N. Y.:	
Ground talc (300 mesh), bags	13.00

Rock Phosphate

Prices given are per ton (2240-lb.) f.o.b. producing plant or nearest shipping point.

Lump Rock

Gordonsburg, Tenn.—B.P.L. 65-70%.	4.00@ 5.00
Mt. Pleasant, Tenn.—B.P.L. 75%	5.50@ 6.00
Tennessee—F.O.B. mines, gross ton, unground brown rock, B.P.L. 72%	5.00
B.P.L. 75%	6.00
Twomey, Tenn.—B.P.L. 65%, 2000 lb.	8.00@ 9.00

Ground Rock

(2000 lbs.)

Centerville, Tenn.—B.P.L. 65%	7.00
Gordonsburg, Tenn.—B.P.L. 65-70%.	4.00@ 4.50
Mt. Pleasant, Tenn.—B.P.L. 65%	8.00
Twomey, Tenn.—B.P.L. 65%	8.00

Florida Phosphate

(Raw Land Pebble)

(Per Ton.)

Florida—F. O. B. mines, gross ton, 68/66% B.P.L., Basis 68%	3.25
70% min. B.P.L., Basis 70%	3.75

Mica

Prices given are net, F.O.B. plant or nearest shipping point.

Franklin, N. C.—Mine run, per lb.	.05@.10
Mine scrap, per ton	20.00
Clean shop scrap, per ton	22.00
Punch mica, per lb.	.05@.10
Pringle, S. D.—Mine run, per ton	125.00
Punch mica, per lb.	.06
Scrap, per ton, carloads	20.00
Rumney Depot, N. H. — per ton, mine run	360.00
Mine scrap	22.00
Clean shop scrap	25.00
Roofing mica	35.00
Dry ground, 20 mesh	35.00
40 mesh	40.00
60 mesh	45.00
200 mesh	65.00
Punch mica, per lb.	.10

Special Aggregates

Prices are per ton f.o.b. quarry or nearest shipping point.

City or shipping point	Terrazzo	Stucco-chips
Barton, Wis., f.o.b. cars		10.50
Brandon, Vt.—English pink and English cream	*11.00	*11.00
Brandon grey	*11.00	*11.00
Brighton, Tenn.—Pink..	6.00	5.00
Mixed pink and bronze	4.50@ 6.00	4.50@ 6.00
All colors, mixed sizes	3.50	3.50
Buckingham, Que.—Buff stucco dash		‡12.00@14.00
Chicago, Ill. — Stucco chips, in sacks f.o.b. quarries		17.50
Crown Point, N. Y.—Mica Spar		9.00@11.00
Dayton, Ohio		6.00@24.00
Easton, Penn., and Phillipsburg, N. J.	12.00@16.00	12.00@16.00
Haddam, Conn. — Felstone buff	15.00	15.00
Harrisonburg, Va.—Bulk marble (crushed, in bags)	†12.50	†12.50
Ingomar, Ohio — Concrete facings and stucco dash		6.00@18.00
Middlebrook, Mo.—Red		25.00@30.00
Middlebury, Vt.—Middlebury white		*9.00
Marble flour, 100% thru 80 mesh		3.50
Crusher run marble		3.50
Milwaukee, Wis.		14.00@34.00
Newark, N. J.—Roofing granules		7.50
New York, N. Y.—Red and yellow Verona		32.00
Red Granite, Wis.		7.50
Stockton, Calif. — "Natrock" roofing grits		11.00@20.00
Tuckahoe, N. Y.—Tuckahoe white	12.00	12.00
Wauwatosa, Wis.		20.00@32.00
Wellsville, Colo.—Colorado Travertine Stone	15.00	15.00

†C.L. L.C.L. 17.00.
*C.L. including bags; L.C.L. 14.50
‡C.L. including bags, L.C.L. 10.00.

Potash Feldspar

Auburn and Brunswick, Me.—Color, white; 98% thru 140 mesh bulk 19.00
Buckingham, Que.—Color, white; analysis, K_2O, 12-13%; Na_2O, 1.75%; bulk 9.00
De Kalb Jct., N. Y.—Color, white; bulk (crude) 9.00
East Hartford, Conn.—Color, white, 95% through 60 mesh, bags 16.00
96% thru 150 mesh, bags 23.00
East Liverpool, Ohio—Color, white; 98% thru 200 mesh, bulk 19.35
Soda feldspar, crude, bulk, per ton 22.00
Erwin, Tenn.—Color, white; analysis, 12.07% K_2O, 19.34% Al_2O_3; Na_2O, 2.92%; SiO_2, 64.76%; Fe_2O_3, .36%; 98.50% thru 200 mesh, bags, 16.90; bulk 15.50
Glen Tay Station, Ont., color, red or punk; analysis: K_2O, 12.81%, crude (bulk 6.75@ 7.00
Keystone, S. D.—Prime white, bulk (crude) 8.00
Los Angeles, Calif.—Color, white; analysis, K_2O, 10.35%; Na_2O, 3.62%; Al_2O_3, 18.71%; SiO_2, 65.48%; Fe_2O_3, .17%; 95% thru 200 mesh, bags included, carloads 22.00
Bulk 20.00
Murphysboro, Ill.—Color, snow white; analysis SiO_2, 64.4%; K_2O, 13%; Na_2O, 2.5%; Fe_2O_3, 0.07%; Al_2O_3, 19.3%; 99% thru 200 mesh, bags 21.00
Bulk 20.00
Penland, N. C.—Color, white; crude, bulk 8.00
Ground, bulk 16.50
Tenn. Mills—Color, white; analysis K_2O, 18%; Na_2O_3, 10%; 68% SiO_2; 99% thru 200 mesh; bulk 18.00
99% thru 140 mesh, bulk 16.00
Toughkenamon, Penn.—Color, cream; 90% thru 200 mesh, bags 14.00, bulk 10.00
Toronto, Can.—Color, flesh; analysis K_2O, 12.75%; Na_2O, 1.96%; crude 7.50@ 8.00
Trenton, N. J.—Crude, bulk 12.00@27.00
99% thru 140 mesh; bulk 16.00
(Bags 11 cents each, non-returnable)

Blended Feldspar

(Pulverized)

Tenn. Mills—Bulk 16.00@20.00

Chicken Grits

Afton Mich. (limestone) per ton 10.00
Belfast and Rockland, Me.—(Limestone), bags, per ton ‡10.00
Brandon and Middlebury, Vt., per ton 12.00‡
Centerville, Iowa (gypsum) per ton 18.00
Chico, Texas (limestone), 100 lb. bags, per ton 8.00@ 9.00
Danbury, Conn. (limestone) 7.00@ 9.00
Easton, Penn.—Per ton, bulk 3.00
Knoxville, Tenn. (limestone), bags, per ton 7.00; bulk 5.00
Los Angeles Harbor (limestone), 100-lb. sack, 1.00; sacks, per ton, 8.50@ 9.50†; bulk, per ton 6.00@7.00†
Gypsum, Ohio.—(Gypsum) per ton 10.00
Limestone, Wash. (limestone) per ton 12.50
Rocky Point, Va. (limestone) 100 lb. bags, 75c; sacks, per ton, 6.00 bulk 5.00
Seattle, Wash.—(Limestone), bulk, per ton 12.50
Warren, N. H.—(Mica) per ton 7.70@7.90‡
Waukesha, Wis.—(Limestone), per ton 8.00
West Stockbridge, Mass.—(Limestone) bulk 7.50@9.00*

*L.C.L.
†Less than 5-ton lots.
‡C.L.

Sand-Lime Brick

Prices given per 1000 brick f.o.b. plant or nearest shipping point, unless otherwise noted.

Barton, Wis. 10.50
Boston, Mass. *17.00
Brighton, N. Y. *19.75
Dayton, Ohio 12.00@13.50
Detroit, Mich. 15.00@17.50
Farmington, Conn. 13.00
Flint, Mich. ¶12.50@16.00
Grand Rapids, Mich. 12.00
Hartford, Conn. *19.00
Jackson, Mich. 12.25
Lancaster, N. Y. 12.50
Madison, Wis. a12.00
Michigan City, Ind. 11.00
Milwaukee, Wis. *13.00
Minneapolis and St. Paul, Minn. 11.25
Minnesota Transfer 10.00
New Brighton, Minn. 10.00
Pontiac, Mich. 12.00@13.50
Portage, Wis. 15.00
Prairie du Chien, Wis. 18.00@22.50
Rochester, N. Y. *19.75
Saginaw, Mich. 13.00
San Antonio, Texas 15.00
Sebewaing, Mich. 11.50
Syracuse, N. Y. 18.00@20.00*
Toronto, Canada 13.00@15.60†
Toronto, Canada 13.10
Wilkinson, Fla. 10.00@12.00

*Delivered on job. †Sales tax included.
‡Less 5%. ¶Dealers' price. (a) Less 1.00 E.O. M. 10 days.

Portland Cement

Prices per bag and per bbl, without bags net in carload lots.

	Per Bag	Per Bbl.
Albuquerque, N. M.		3.37
Atlanta, Ga.		2.35
Baltimore, Md.		2.15
Birmingham, Ala.		2.30
Boston, Mass.		2.43
Buffalo, N. Y.		2.28
Butte, Mont.	.90¼	3.61
Cedar Rapids, Iowa		2.34‡
Charleston, S. C.		2.35
Cheyenne, Wyo.	.82¾	3.31
Cincinnati, Ohio	56¾	2.37‡
Cleveland, Ohio		2.29‡
Chicago, Ill.		2.10‡
Columbus, Ohio		2.24
Dallas, Texas		2.10
Davenport, Iowa		2.29‡
Dayton, Ohio	.57	2.28
Denver, Colo.	.66¼	2.65
Detroit, Mich.		1.95
Duluth, Minn.		2.09‡
Houston, Texas		2.60
Indianapolis, Ind.		2.19
Jackson, Miss.		2.50
Jacksonville, Fla.		2.20
Jersey City, N. J.		2.13
Kansas City, Mo.		1.92
Los Angeles, Calif.	.61†	2.44†
Louisville, Ky.	.54¼	
Memphis, Tenn.		2.60‡
Milwaukee, Wis.		2.25‡
Minneapolis, Minn.		2.32‡
Montreal, Que.		1.36
New Orleans, La.		2.20
New York, N. Y.		2.05
Norfolk, Va.		2.07
Oklahoma City, Okla.		2.46‡
Omaha, Neb.		2.36‡
Peoria, Ill.		2.27‡
Philadelphia, Penn.		2.21
Phoenix, Ariz.		2.91
Pittsburgh, Penn.		2.09‡
Portland, Colo.		2.80
Portland, Ore.		2.60
Reno, Nevada		2.91
Richmond, Va.		2.34
Salt Lake City, Utah	.70¼	2.81
San Francisco, Calif.		2.31‡
Savannah, Ga.		2.50
St. Louis, Mo.	.55	2.20‡
St. Paul, Minn.		2.32‡
Seattle, Wash.	10c discount	2.50
Tampa, Fla.		2.25
Toledo, Ohio		2.20‡
Topeka, Kans.		2.41‡
Tulsa, Okla.		2.33‡
Wheeling, W. Va.		2.07
Winston-Salem, N. C.		2.78

NOTE—Add 40c per bbl. for bags.
†Delivered on job in any quantity, sacks extra.
‡Ten cents less to dealers.

Mill prices f.o.b. in carload lots, without bags, to contractors.

	Per Bag	Per Bbl.
Buffington, Ind.		1.85
Chattanooga, Tenn.		2.45*
Concrete, Wash.		2.35
Davenport, Calif.		2.05
Detroit, Mich.		2.15
Hannibal, Mo.		1.85
Hudson, N. Y.		1.95
Leeds, Ala.		1.95
Mildred, Kans.		2.35
Nazareth, Penn.		1.95
Northampton, Penn.		1.85
Richard City, Tenn.		2.05
Steelton, Minn.		1.90
Toledo, Ohio		2.20
Universal, Penn.		1.85

*Including sacks at 10c each.

Gypsum Products—CARLOAD PRICES PER TON AND PER M SQUARE FEET, F. O. B. MILL

	Crushed Rock	Ground Gypsum	Agricultural Gypsum	Stucco Calcined Gypsum	Cement and Gauging Plaster	Wood Fiber	White Gauging	Sanded Plaster	Keene's Cement	Trowel Finish	—Plaster Board— ¼x32x 36". Wt. 1500 lb. Per M Sq. Ft.	⅜x32x 36". Wt. 1850 lb. Per M Sq. Ft.	Wallboard, ⅜x32 or 48". Lgths. 6'-10', 1850 lb. Per M Sq. Ft.
Arden, Nev. and Los Angeles, Calif.	3.00	8.00u	8.00u	10.70u	10.70u					11.70u			
Centerville, Iowa	3.00	10.00	15.00	10.00	10.00	10.50	13.50			13.50			
Detroit, Mich.‡				11.30	11.30	11.30		8.00					
Delawanna, N. J.						8.00		8.25@9.40			.14½s	.15½s	40.00@41.00
Douglas, Ariz.			7.00			15.50d	18.50		30.00	15.50			
Grand Rapids, Mich.	2.75	6.00	6.00	8.00	9.00	9.00	17.50		24.55	20.00			
Gypsum, Ohio‡	3.00	4.00	6.00	8.00	9.00	9.00	18.00	7.00	27.00	19.00		15.00	30.00
Los Angeles, Calif.				8.65r									
Port Clinton, Ohio	3.00	4.00	6.00	10.00	9.00	9.00	21.00	7.00	30.15	20.00		20.00	30.00
Portland, Colo.				10.00									
San Francisco, Cal.				14.00	15.40		15.40						
Seattle, Wash.	6.50		11.00	16.00									
Sigurd, Utah									21.50				
Winnipeg, Man.	5.00	5.00	7.00	13.00	14.00	14.00					20.00	25.00	33.00

NOTE—Returnable bags, 10c each; paper bags, 1.00 per ton extra (not returnable).
*To 3.00; †to 11.00; ‖to 12.00; ‡prices per net ton, sacks extra; (a) to 25.00; (b) net; (c) gross; (d) hair fibre; (e) delivered; (h) delivered in six states; (i) delivered on job; (k) sacks 12c extra, rebated; (m) includes paper bags; (o) includes jute sacks; (r) including sacks at 15c; (s) per board; (t) to 16.50; (u) includes sacks; (v) F.O B. N. Y. C. and dealers yard in mill locality.

Market Prices of Cement Products

Concrete Block

Prices given are net per unit, f.o.b. plant or nearest shipping point

City of shipping point	Sizes 8x8x16	8x10x16	8x12x16
Camden, N. J.	17.00		
Columbus, Ohio	.16@.18a		
Detroit, Mich.	.16		.18
Forest Park, Ill.	18.00*	23.00*	30.00*
Grand Rapids, Mich.	.15		
Graettinger, Iowa	.18@.20		
Indianapolis, Ind.	.14@.16†		
Los Angeles, Calif.¶	5¾x3½x12—55.00	7¾x3½x12—65.00	
Oak Park, Ill.	.18@.21a		
Olivia and Mankato, Minn.	9.50b		
Somerset, Penn.	.20@.22		
Tiskilwa, Ill.	.16@.18†		
Yakima, Wash.	20.00*		

*Price per 100 at plant. †Rock or panel face. (a) Face. ‡Delivered. ¶Price per 1000. (b) Per ton.

Cement Roofing Tile

Prices are net per sq. in carload lots, f.o.b. nearest shipping point unless otherwise stated.

Camden and Trenton, N. J.—8x12, per sq.

Red	15.00
Green	18.00

Chicago, Ill.—per sq. 20.00

Cicero, Ill.—Hawthorne roofing tile, per sq.

	Chocolate Red and Orange	Green and Blue	Yellow, Tan and Slate Gray
French and Spanish†	$11.50	$13.50	$12.75
Ridges (each)	.25	.35	.30
Hips	.25	.35	.30
Hip starters	.50	.60	.60
Hip terminals, 2-way	1.25	1.50	1.50
Hip terminals, 4-way	4.00	5.00	5.00
Mansard terminals	2.50	3.00	3.00
Gable finials	1.25	1.50	1.50
Gable starters	.25	.35	.30
Gable finishers	.25	.35	.30
*End bands	.25	.35	.30
*Eave closers	.06	.08	.06
*Ridge closers	.05	.06	.05

*Used only with Spanish tile.
†Price per square.

Houston, Texas.—Roofing Tile, per sq.	25.00
Indianapolis, Ind.—9"x15"	
Gray	10.00
Red	11.00
Green	13.00

	Per sq.
Waco, Texas:	
4x4	.60

Cement Building Tile

Cement City, Mich	Per 1000
5x8x12	55.00
Detroit, Mich.	Per 100
5x4x12	4.50
5x8x12	8.00
Longview, Wash. (Stone-Tile)	Per 1000
3½x6x12	60.00
3½x8x12	65.00
Mt. Pleasant, N. Y.:	Per 1000
5x8x12	78.00
Grand Rapids, Mich.:	Per 1000
5x8x12	70.00
Houston, Texas:	
5x8x12 (Lightweight)	80.00
Pasadena, Calif.—(Stone-Tile)	Per 100
4x6x12	4.00
4x8x12	5.50
Tiskilwa, Ill.—8x8, per 100	15.00
Wildasin Spur, Los Angeles, Calif. (Stone-Tile)	Per 1000
3½x6x12	50.00
3½x8x12	60.00
Prairie du Chien, Wis.	14.00 22.50@27.00
Yakima, Wash.—Building tile:	
5x8x12	.10

Cement Drain Tile

Graettinger, Iowa—5 to 36 in., per ton	8.00
Olivia and Mankato, Minn.—Cement drain tile, per ton	8.00
Tacoma, Wash.—Drain tile per ft.:	
3 in.	.04
4 in.	.05
6 in.	.07½
8 in.	.10
Waukesha, Wis.—Drain tile, per ton	9.00

Concrete Brick

Prices given per 1000 brick, f.o.b. plant or nearest shipping point.

	Common	Face
Appleton, Minn.	22.00	30.00@35.00
Baltimore, Md. (Del. according to quantity)	15.50	22.00@50.00
Camden and Trenton, N. J.	17.00	
Ensley, Ala. ("Slagtex")	14.50	22.50@33.50
Eugene, Ore.	25.00	35.00@75.00
Friesland, Wis.	22.00	32.00
Longview, Wash.	18.00	
Milwaukee, Wis.	14.00@15.00	30.00@75.00
Mt. Pleasant, N. Y.		14.00@23.00
Omaha, Neb.	18.00	30.00@40.00
Pasadena, Calif.	11.00	
Philadelphia, Penn.	15.00	20.00
Portland, Ore.	17.00	25.00@75.00
Prairie du Chien, Wis.	14.00	23.00@27.00
Rapid City, S. D.	18.00	25.00@40.00
Waco, Texas	16.50	32.50@125.00
Watertown, N. Y.	20.00	35.00
Wauwatosa, Wis.	14.00	21.00@42.00
Westmoreland Wharves, Penn.	15.00	20.00
Winnipeg, Man.	14.00	22.00
Yakima, Wash.	22.50	

†Gray. ‡Red.

Current Prices Cement Pipe

Prices are net per foot f.o.b. cities or nearest shipping point in carload lots unless otherwise noted.

Culvert and Sewer	4 in.	6 in.	8 in.	10 in.	12 in.	15 in.	18 in.	20 in.	22 in.	24 in.	27 in.	30 in.	36 in.	42 in.	48 in.	54 in.	60 in.
Detroit, Mich.								15.00 per ton									
Graettinger, Iowa	.04½d	.05½	.08½	.12½	.17½	.....	.40	.50	.60	.70	.....	.....	.....	.....	.....	.....	.....
G'd Rapids, Mich. (b)	.....	.....	.....	.60	.72	1.00	1.28	.....	.....	1.92	2.32	3.00	4.00	5.00	6.00	.....	.....
Houston, Texas	.....	.19	.28	.43	.55½	.90	1.30	.....	†1.70	2.20	.....	.....	.....	.....	.....	.....	.....
Indianapolis, Ind. (a)	.....	.....	.....	.80	.90	1.10	1.30	.....	.....	1.70	.....	2.70	.....	.....	.....	.....	.....
Longview, Wash.							Sewer pipe 40% off list, culvert—list										
Mankato, Minn. (b)	.....	.....	.....	.....	.....	.....	.....	.....	.....	1.50	1.75	2.50	3.25	4.25	.....	.....	.....
Newark, N. J.							6 in. to 24 in., $18.00 per ton										
Norfolk, Neb.	.....	.....	.....	.....	.90	1.00	1.13	1.42	.....	.....	2.11	.....	2.75	3.58	.....	6.14	7.78
Olivia, Mankato, Minn.							12.00 per ton										
Paullina, Iowa‡	.....	.....	.....	.....	.....	.....	.....	2.25	.....	2.11	.....	2.75	3.58	.....	6.14	.....	7.78
Somerset, Penn.	.....	.....	.....	.....	1.08	1.25	1.65	.....	.....	2.50	.....	3.65	4.85	7.50	8.50	.....	.....
Tacoma, Wash.	.15	.17	.22½	.30	.40	.55	.70	.....	.....	.....	.....	.....	.....	.....	.....	.....	.....
Tiskilwa, Ill. (rein.) (a)	.....	.....	.....	.65	.75	.85	1.10	1.60	.....	1.90	.....	2.25	3.40	.....	5.50	.....	.....
Wahoo, Neb. (b)	.....	.....	.....	.....	1.00	1.13	1.42	.....	.....	2.11	.....	2.75	3.58	4.62	6.14	6.96	7.78
Waukesha, Wis.							12 in. to 60 in. 18.00 per ton										
Yakima, Wash.							$10.00 per ton										

*30-in. lengths up to 27-in. diam., 48-in. lengths after; (a) 24-in. lengths; (b) Reinforced; (c) Interlocking bar reinforced.
†21-in. diam. ‡Price per 2 ft. length. (d) 5 in. diam. [1]@1.08 [2]@1.25. [3]@1.65. [4]@2.50. [5]@3.85. [6]@5.00. [7]@7.50.

New Block Plant at Nashville

ABOUT 100 architects and contractors of Nashville attended the recent formal opening of the new plant of the Nashville Breeko Block and Tile Co., Nashville, Tenn. The company was recently organized to manufacture cement block and tile, using coke breeze and cinders for aggregate.

The new plant is modern, well equipped to produce about 5000 block and tile per day and with the storage yard covers nearly two acres of ground. Officers and directors of the company are J. W. Jakes, president; H. V. Hopton, vice president; Charlie Akers, secretary-treasurer; Buford Dickerson, O'Bryan Washington, James A. Cayce, Vernon Tupper, Tillman Cavert and Will R. Manier, Jr., directors.—*Nashville (Tenn.) Banner.*

W. C. Ross Enters Cement Products Business

ANNOUNCEMENT is made that W. C. Ross has resigned his position as district engineer in charge of the Birmingham, Ala., office of the Portland Cement Association, to engage in the manufacture of cement products near Memphis, Ark. Mr. Ross is said to have purchased the franchise for the manufacture of "Stone-Tile" in Shelby County, Tenn., and two adjoining counties, Crittenden County, Ark., and De Soto County, Miss.

A site for the plant has been selected in the Chelsea district of Memphis and will be operated under the name of Stone-Tile Supply Co. It will have equipment to produce 5000 units per day. The tile will be placed on the market about October 1. Three sizes will be made: partition tile 3½x4x12 in.; 6-in. wall tile, 3½x12x6; 8-in. wall tile, 3½x8x12.

Mr. Ross came to Birmingham in December of last year to succeed J. R. Fairman as district engineer of the Portland Cement Association. For about a year previous he had been a field engineer in Florida, with headquarters at Tampa.

From 1915 to 1924, when he joined the association, he was in business for himself in Little Rock, practicing civil engineering. Prior to that he was at one time assistant city engineer for Little Rock, and later assistant state highway engineer for Arkansas.

Current Abstracts of Foreign Literature

Hydraulic Cement From Copper Slag. Residual copper slags from the recovery of copper from its alloys with base metals and containing 42% silica, 13.2% ferrous oxide (FeO), 1.7% ferric oxide (Fe_2O_3) and 23.5% of lime in addition to copper, aluminum, zinc and magnesium, can be used for the production of a cement by an ordinary oxidizing roast with the addition of lime. The most suitable proportion of lime and slag must be determined empirically. The presence of cupric and cuprous oxides is not detrimental. Phosphoric acid greatly diminishes the strength if more than 0.6% of P_2O_5 is present in the finished cement. If 3% of gypsum is added setting begins more slowly but complete setting is accelerated. *Zeitschrift fuer angewandte Chemie, 39,* (1926), 271-6.

Cooling and Hydrating Cement Clinker From Rotary Kilns. Additional steam for hydrating the clinker in the process described in German Patent No. 410-325 is generated in the cooling chamber and is added to the mixture of air and steam. The waste heat of the gases withdrawn from the apparatus is utilized in heat exchangers. *British Patent No. 424,065.*

Evaluation of the Hydraulic Properties of a Crushed Slag. The important point that the manufacturer of iron portland cement and slag cement must consider is the effect of the changes in the chemical composition of the slag on the hydraulic properties of the portland cement clinker to which the new material is added. It has been shown that there are certain limits between which the ingredients of the slag may vary in order to make the effect of the slag on the cement favorable and unfavorable. These are given in the following tabulation:

	Reactive slag	Non-reactive slag
Silica	27 to 31%	27 to 33%
Alumina	13 to 20%	9 to 12%
Lime	45 to 50%	40 to 51%
Calcium sulphide	4 to 8%	2 to 4%
Magnesia	2 to 8%	1 to 3%

However, the only method that is used to any extent at the present time to determine the suitability of a slag for this purpose is to add it to the cement clinker and to watch the effect over a period of weeks. Quicker methods appeared to be desirable and an attempt has been made to develop them.

Dyeing tests were developed which were used in determining the resistance of the cement made with slag to the penetration of water. Details of this test are given in the original article, together with photo-micrographs.

The test is made in the following manner: About 1.5 grams of the pulverized slag (the residue remaining on a 10,000 mesh screen) were stirred for two days with about 400 ccm. of a 5% solution of potassium hydroxide. After the first day the slags generally settle to the bottom of the beaker in a thin layer. After the second day the slag appears to be voluminous and flaky. The liquor is decanted, well washed and then treated with a neutral solution of methylene blue by shaking in a test-tube. About 0.2 gram of slag is shaken with 10 ccm. of 0.5% methylene blue solution for five minutes. The slag is then decanted again and washed on a filter with water, after which it is dried in an oven and then brought onto a slide for examination under the microscope. Then the percentage of translucent to transparent, and hence not colored particles is determined wtih the help of the Hirschwald planimeter-oculars.

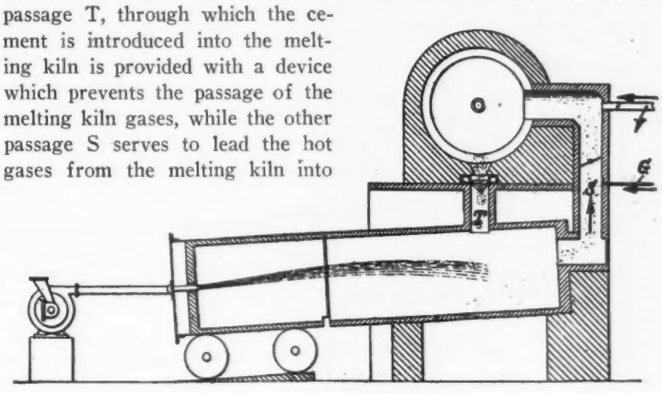
The conclusions that were drawn from these experiments are as follows:

1. It is possible to determine the relative content of a pulverized slag in reactive silicic acid after its treatment with 5% potassium hydroxide solution and shaking with neutral methylene blue solution by examination under a microscope.

2. The color reaction with neutral methylene blue solution indicates considerably quicker hydraulic behavior of a slag as an additive material in the manufacture of blast furnace cements, and particularly the strength of the mortar made with it after laying in water, than the usual strength tests.

3. The determination of the index of refraction of the sand is also important and when this is less than 1.650 the material must be considered as unsuitable in cement manufacture. *Zement* (1926), 527-531; 547-549.

Kiln for Making Cement Fondu. The illustration shows a kiln which is designed for the manufacture of a cement fondu. The installation consists of two separate kilns, one used for the preliminary burning of the cement and the other for its fusion. The two kilns are connected by two passages T and S which are independent of each other. The passage T, through which the cement is introduced into the melting kiln is provided with a device which prevents the passage of the melting kiln gases, while the other passage S serves to lead the hot gases from the melting kiln into the preliminary burning kiln. Air ducts are shown at V and G. *German Patent No. 4,429,555.*



Kiln for making cement fondu

Cement Making Process. Clinker rich in lime is quenched with water, the finer portion separated and the lumps ground and again mixed with the powder. Blast furnace slag is added, and the mixture dried, or completely slaked as desired. Alternatively, clinker rich in lime or hydraulic lime may be slaked by means of moist, granulated, blast furnace slag. *French Patent No. 599,104.*

Aluminous Cements. To the initial material small amounts of alkali salts, such as chlorides, sulphates, carbonates, silicates or aluminates, calcium chloride, calcium fluoride, or cryolite are added, and the mixture is then heated to fusion, sintering or to a temperature at which neither fusion nor sintering occurs. The addition facilitates the formation of hydraulic products which set more rapidly than the untreated material. *French Patent No. 597,978.*

Hydraulic Ingredients in Ferrite and Aluminous Cements. It is held that the tricalcium silicate and the tricalcium aluminate do not form the hydraulic constituents of portland cement and cement fondu. The compounds that give these cements their characteristic properties are far more complicated in structure. The presence of barium oxide and strontium oxide does not affect the hydraulic properties of the cement, but these are due to the presence of lime. Iron oxide and lime give a hydraulic ferrite which has the formula, $2Fe_2O_3$, 5-7 CaO. Iron oxide containing waste materials from all sorts of industrial processes can be very well used for the manufacture of iron cements by admixture with lime. The process is carried out in the rotary kiln, which is maintained at a temperature of 1100 to 1400 deg. C, that is below the melting point of the mixture. These sintered cements do not wash out and resist the action of waters containing sulphates and alkalies. The time of setting is regulated by controlling the duration of the burning. Ferrite cements must be exposed to the air before setting, as carbon dioxide is necessary for the initial set. This is not necessary in the case of aluminous cement or ferrite-aluminous cements. Ferrite - aluminous cements are also not attacked by sulphate - containing water and are also resistive to the usual mineral constituents of sea water. *Moniteur Scientific,* 16, 97.

Mountain Stone Company Makes First Shipments

THE Mountain Stone Co. of Fort William, Ont., in which the Clement K. Quinn Co. of Duluth is interested and is in charge of sales and shipments, recently shipped its first cargo of crushed rock. The property owned is about one mile east of Fort William and consists principally of a deposit of high-grade traprock material, broken down by weathering, at the foot of a low mountain which rises abruptly about 2000 ft. from the Kiminiskai river, which is navigable for lake boats at and above this point.

The shattered condition of the material renders it unnecessary to do any blasting. The rock is crushed to a maximum of 3 in. in size and conveyed to screens for washing and sizing. From the screens the material drops into bins, from which it is drawn off into trains of 10-yd. cars and hauled 2000 ft. to the storage piles on the river. From the storage piles the rock is drawn through chutes on to a 36-in. conveyor belt in a tunnel below. From the main conveyor belt the material is loaded on boat by means of counterbalanced shuttle conveyor.

The plant is equipped to produce crushed rock of all commercial sizes, including rock chips, and has a capacity of 2000 tons per day. It is expected that principal demand for the product will come from Detroit, Cleveland and other lower lake points.

White Cliffs Plant To Be Re-opened

THE Lime Products Co. of Fordyce, Ark., which recently purchased the limestone deposits and plant at White Cliffs, Ark., have begun work on conditioning the plant and equipment, preparatory to beginning operations. The principal work of repairing is on the railroad tracks leading out to the plant, the road having been allowed to get in bad condition during the time the plant has been out of operation. The plant itself is said to be in excellent condition in almost every particular.

The plant was built a few years ago by the Krippendorf-Tuttle White Cliff Products Co. and was operated for some time, although it is said that the overhead expenses of the plant prevented the company from making money from its operation. While no announcement has yet been made by A. B. Banks, president of the Fordyce company, as to the operation personnel, it is expected that efficient executives will be in charge and that everything will be done to make the plant a paying proposition, so as to insure its permanency.

It is the intention of the new company to produce pulverized limestone for agricultural, rubber and paint industries. The deposit is said to be one of the largest in the world, and numerous reports show it to be of high grade. The operation of former plants on the property has been prohibitive for various reasons, and every company which has started operations has failed because of the handicaps.—*De Queen (Ark.) Bee.*

Michigan State Board Turns Down Offers for Cement Plant

STRENUOUS objection to the sale of the state cement plant at Chelsea, Mich., was voiced to the state administrative board by the special committee of the prison commission appointed to consider three proposals for sale. The committee, composed of Frank D. Laman, Detroit, and Charles A. Blaney, Kalamazoo, after advising against the sale of the plant, advised that if the board decided it desired that the plant be sold, the sale be by advertising and sealed bids.

The board had met, it is said, to consider an offer of $700,000 made by J. B. John, vice-president, Newaygo Portland Cement Co., and two other verbal offers, one of $750,000 from H. F. Jennings, secretary of the Wabash Portland Cement Co., and another of $800,000 from an undisclosed source.

After hearing the report, Charles DeLand, secretary of state, moved that the prison commission be ordered to sell the plant. The other members of the administrative board refused to support this action and it failed to come before the board for want of a second.

M. Blaney, who read the report of the commission, showing a profit of $361,000 under the operation of the plant up to August 1, stated that the incomplete reports would show an August profit of $45,000 and that he was certain the September profit would reach $50,000.

Depreciation of the plant is taken care of by constant repair, Henry Croll, state statistician, explained, and the plant is in such good condition that it can double capacity if fully occupied.

The Chelsea plant has been operated by the state the past 4 years under lease and was purchased for $500,000 last year, the rental of $75,000 per year applying on the purchase. It is operated entirely by prison labor, employing from 150 to 300 men. The wet process of manufacture is used and the 3 kilns, 8x125 ft., produce about 2100 bbl. per day. In 1925 about 375,000 bbl. were made and this year the output is expected to be above this.—*Grand Rapids (Mich.) Herald.*

St. Joe Company Rebuilding Burned Plant

WITH plans for a modern plant and a capacity double that of the old one, work is now going actively forward on rebuilding the mill, cooperage department, storage sheds and other buildings of the St. Joe Lime and Stone Co., Little Rock, Ark., damaged by fire a short time ago. Already the work on repairing one of the kilns has so far advanced that it is operating daily and lime for building purposes is being shipped again, the kiln having resumed operations recently.

John O. Wilson, general manager of the plant, announced that there will be another large kiln constructed to accommodate the increased demands of the new hydrating plant now being installed. The hydrating plant will be electrically operated. To supply the new kilns and crushers with rock, a new ledge is being opened up and new tracks will be laid from this to the main part of the plant. It is expected that this work will be completed and the lime plant will be running at full capacity within a few months. —*Little Rock (Ark.) Democrat.*

Universal Company Extends Holdings

ACQUISITION of an additional gypsum rock deposit adjoining its present properties at Fort Dodge, was announced recently by the Chicago, Ill. Universal Lime and Gypsum Co.

The deposit is on the Frederic Larrabee property, and the vein, more than 20 ft. wide, will afford a 25-year supply, the announcement said. Its proximity to present sites of operation will obviate the necessity of sinking a shaft, and operations will merely be continued into the new deposit.

River Company to Establish Gravel Plant at Benicia

ACCORDING to a report in *Sacramento (Calif.) Bee* the River Sand and Gravel Co., San Francisco, Calif., is to establish a plant at Benicia, Calif. on the property of the Southern Pacific Railroad Co.

Two or more dolphins will be constructed by the Southern Pacific company to parallel the wye so that the large sand and gravel barges can be tied for car loading or storage in bunkers. The river company is now operating two large barges and a third is being constructed and a fourth is under contemplation.

Arkansas Slate Quarries Leased

A NEW company, incorporated for $50,000 and known as the American Slate Co., has acquired the lease rights on what is claimed to be one of the largest slate quarries in Arkansas. The organizers of the company are Roy and Bert Buckley of Wichita, Kas.

The quarry, it is said, contains three large veins of slate, readily accessible and with wide variety of colors in addition to the usual black and gray. It is expected that operations will begin shortly after the machinery for manufacture is installed. The company officials say that there is a favorable market in the locality, for whatever slate is used comes from the New England states and sells at a high price, due to freight charges. General offices will be located at Wichita, Kans., which will also be the distributive center for the slate produced.—*Wichita (Kans.) Beacon.*

New 18-inch Superior McCully Fine Reduction Gyratory Crusher

The latest development in the Superior McCully Fine Reduction line, furnished to a large Cement Company--having two feed openings, each 18 in. by 68 in.--capable of taking the product from the largest size primary crushers --capacity with minimum discharge opening of 2 1-2 in.--225 to 275 tons per hour.

The 18-in. Crusher incorporates all the features which have contributed so largely to the wonderful success of the smaller sizes of this type:

Openings in main frame machined to permit utilizing either drive arrangement.

Vertical reversible concaves
Reversible top shell
Short rigid shaft
Large eccentric bearing
Steel gears
Cut teeth
Positive geared pump lubricating eccentric and gearing

ALLIS-CHALMERS

MILWAUKEE, WIS. U. S. A.

News of All the Industry

Incorporations

El-Jobe-An Magnesite Stucco Corp., Providence, R. I., 475 shares common and 175 shares preferred, both of no par value. W. W. Lee, R. M. Gray and J. P. Gray.

Patuxent River Sand and Gravel Co., Wilmington, Del., $100,000. W. L. N. Lafland, W. Virdin, M. W. Cole. (Capital Trust Co. of Delaware.)

Kirk S. Johnson Co., Seattle, Wash., $50,000. To engage in the sand, gravel and crushed stone business. Kirk S. Johnson and Helen B. Johnson.

Atlantic Concrete Products Co., Buena, N. J., 1,000 shares of no par value. C. E. Engelman, C. Swenson and F. Vanderborgh.

United States Quarry Tile Co., Wilmington, Del. T. L. Croteau, A. L. Nutler, A. Jervis. (Corp. Trust Co. of America.)

Fox Hills Concrete Block and Supply Co., Long Island City, N. Y., $15,000. N. M. Olsen, J. Coughlin and T. A. O'Neil.

Maryland Quartz Co., Baltimore, Md. Michael Miller and M. M. Goodman. Office: 452 Equitable Bldg., Baltimore.

Pyramid Slate & Tile Co., Inc., New Orleans, La., $20,000. Richard E. Mire, 4528 Prytania street, and others.

Mississippi Coast Sand and Gravel Co., Mc-Henry, Miss., $25,000. John Mobley, E. E. Colmer and others.

Wisconsin Lannon Stone Co., Milwaukee, Wisc., $150,000. H. Schattschneider, H. E. Parette and H. K. Curtis.

Storm King Lime and Crushing Stone Corp., Newburgh, N. Y., $10,000. J. Cohans, M. Levinson, D. Roth.

Berkeley Stone Corp., Charlottesville, Va., $10,000. Robert L. McElroy, H. P. Berkeley and others.

Platte Valley Sand and Gravel Co., Fremont, Neb., $25,000. C. Tribsee, M. M. Ward and others.

Allen Bros., Inc., Cameron, Ark., $35,000. J. S. and W. P. Allen. To conduct a quarrying business.

West Virginia Cement Co., Wilmington, Del., $2,523,000. (Delaware Registration Trust Co.)

Hilltop Gravel Corp., Houston, Tex., $30,000. L. Overton, E. Schmidt and R. E. Watters.

Arkansas Brick and Tile Co., Little Rock, Ark., $10,000. M. W. Hardy, Guy Dickinson.

James Stone Co., Richland, Texas, $175,000. W. S. James, Winston Carter.

Browning Kaw River Sand Co., Lawrence, Kans., $50,000.

Quarries

Railroaders Lime Co., Corydon, Ind., has been put into receivership by order of Judge Wilson acting on the petition of A. B. Dickert, trustee for the guarantors of the company. Clarence A. Quebbeman has been appointed the receiver and will attempt to place the business on a sound basis.

Louisa County, Iowa, has leased the Herrick quarry near Wapello and will install a rock crusher on the property. The material made will be used for surfacing a portion of the highways in the district.

Lewis County, Wash. Over 10,000 cu. yd. of basalt were loosened at a single blast set off at the county quarry. Sixty ft. of tunnel and four 35-ft. cross cuts had been bored to hold the charge of 8000 lb. of dynamite. The rock will be used in the construction of a new highway between Napavine and Winlock, Wash.

Sand and Gravel

Winchester Gravel Co., Winchester, Ind., recently organized with a capital of $40,000, plans to operate local sand and gravel properties, and will equip a complete handling plant. Ernest M. and Everett Clark, Winchester, head the company.

River Sand and Gravel Co., San Francisco, Cal., has begun the construction of a plant at Benicia, Solano county, Cal., where they will be served by the Southern Pacific railroad.

Klamath Falls, Ore. Porter sand and gravel plant running up to capacity.

L. A. Thorson, Melvin, Minn., has opened a gravel pit on the Great Northern railroad near Benoit. The entire summer has been spent in developing the deposit, which is said to be one of largest in the Northwest. Mr. Thorson also operates another pit near Melvin which is also on the Great Northern railroad.

Moraine Gravel Co., Plymouth, Wisc., has removed its office to larger quarters in the Laack Building.

Leonard Gravel Co., Lansing, Mich., has purchased another pit which it will commence operations on. The company is now shipping about 8 cars per day from a deposit it recently opened.

Morgan Parker Gravel Co., Sibley, La., is installing new machinery which includes another engine and additional tracks. Recently the company increased its holdings through purchase of additional gravel properties and expanded its business activities.

Sparks Bros. have purchased 7 acres of gravel land at Anacortes, Wash., and are planning the operation of a washed sand and gravel plant on the deposit.

McGrath Sand and Gravel Co., Lincoln, Ill., have established a branch office at Mt. Vernon, Ill., with Herschel King in charge. The company owns and operates several gravel plants in central Illinois and recently acquired control of a pit at Shawneetown.

Agricultural Limestone

Cook Stone Co., Hopkinsville, Ky., have started production of pulverized limestone for rock dusting of mines. The plant, said to be the only one of its kind in the vicinity, has already booked many orders for the product.

Cement Products

Massey Concrete Products Co., Chicago, Ill., has moved its Pacific Coast headquarters from the Matson building in San Francisco to 801 Pacific Electric building, Los Angeles, Cal. S. V. Shannon is western manager.

Mosaic Tile Co., San Diego, Cal., will install a small rock crushing plant, to cost about $1200, at 1314 Schley street.

Winterhaven Duntile Products Co. has completed its plant and installed all equipment at Winter Haven, Fla.

Economy Duntile Co., Birmingham, Ala., is erecting a 40x50-ft. addition to its plant.

California-Idaho Cement Co. has opened offices at 68 Post street, San Francisco, Cal.

Cement Products Co., Birmingham, Ala., have recently completed a new building, 35x100 ft., which will be used for the manufacture of cement burial vaults. The company also makes other cement products which are shipped throughout the south. G. L. Cox is the principal owner.

Inter-Lock Tile Co., Hollywood, Fla., has been granted permission by the Underwriters Association to affix the Underwriters' label to their product. The label is a guarantee that the blocks have been made under specifications of the association and meet all the requirements such as crushing strength, degree of impermeability of water and fire, etc.

Rock Phosphate

S.S. Hornby Castle sailed recently for Ghent, Belgium, via Charleston, S. C., with 3150 tons of phosphate loaded at Fernandina, Fla.

Obituaries

Joseph S. Hanahan, vice president of the Carolina Portland Cement Co., died at the Thompson Memorial Hospital, Charleston, S. C., on Sept. 2, following an illness of several weeks' duration.

Manufacturers

The Mundy Sales Corp. announces the following new distributors: Bacon Engineering Sales Co., 251 Erie Building, Cleveland, Ohio; Barnett-Dunning, Inc., 143 E. Ohio St., Indianapolis, Ind.; Toledo Sales & Engine Co., 16 No. St. Clair St., Toledo, Ohio.

Republic Motor Truck Co., Inc., Alma, Mich., has opened a direct factory branch at 26th and Moore Sts., Philadelphia, Penn. C. L. Bowler has been appointed branch manager.

Burke Electric Co., Erie, Penn., announces the appointment of E. I. Van Doren, 206 Times Bldg., Troy, N. Y., as district sales agent.

C. H. Johnson has been appointed engineer, service department, of the Timken Roller Bearing Co., Canton, Ohio. He will have direct charge of the installation of Timken bearings in automotive and industrial applications.

Kirk and Blum Mfg. Co., Cincinnati, Ohio, have recently doubled their plant capacity through purchase of an adjoining factory. The expansion has been made necessary through the development of their "contract manufacturing" department, which is handling production of sheet metal parts for many manufacturers.

Morrison & Risman Co., Inc., Buffalo, N. Y., have secured the order to furnish all railroad track materials for the Pontiac motor car plant at Pontiac, Mich. This plant will have approximately 9½ miles of railroad track on its own property.

Harnischfeger Corp., Milwaukee, Wisc., announce the appointment of L. N. Ridenour, formerly with the Wellman-Seaver-Morgan Co., as special factory representative and E. L. Puckett as district manager of the Charlotte office, located at 1118 Independence Trust Bldg.

General Excavator Co., which purchased the land, buildings and equipment formerly the property of the Fairbanks Steam Shovel Co., Marion, Ohio, is now rehabilitating, rebuilding and re-equipping this property. The new company, which is composed of local men, will soon announce a new ½-yd. combination shovel, dragline, crane, back-trencher and level street grader to be either gasoline or electric powered. It will be mounted on continuous treads and the whole ensemble is said to be different from anything ever offered in this field. The machinery has been perfected and production will probably start in October. The outfit will be exhibited at the Road Show to be held in Chicago in January, 1927.

Kuhlman Electric Co., Bay City, Mich., announces the appointment of the Continental Sales and Engineering Co., 839 Oliver building, Pittsburgh, Penn., as district representatives in Pittsburgh.

Burke Electric Co., Erie, Pa., announces the appointment of C. A. Cotton, 135 High Street, Boston, Mass., as district sales agent for the New England territory.

Climax Engineering Co., Clinton, Iowa, announces the appointment of the Maerky Machine Works, 240 Cherry St., Philadelphia, Penn., George M. Strohlein, proprietor and manager, as official parts and service station in the city of Philadelphia and vicinity.

Trade Literature

NOTICE—Any publication mentioned under this heading will be sent free unless otherwise noted, to readers, on request to the firm issuing the publication. When writing for any of the items kindly mention ROCK PRODUCTS.

G. E. Bulletins. GEA-38 on type CO-1820, d.c. crane and hoist motors; **GEA-71A** on types MT (3 phase) and type MQ (2 phase) wound rotor induction motors—"900 Series," and **GEA-452** on automatic arc welding apparatus and accessories.

Chains and Sprockets. Catalog No. **46** illustrating and describing complete line of chains and sprockets to meet different service conditions. Specifications and price list. WEBSTER MFG. CO., Chicago, Ill.

Power Transmission Machinery. New catalog No. **26** in three sections on various types of power transmission such as flexible couplings, clutch pulleys, rope drives, gears, speed transformers, etc. Excellent engineering data, capacity tables, data on design, etc. Illustrations and line drawings. 258 pp. HILL CLUTCH MACHINE AND FOUNDRY CO., Cleveland, Ohio.

Material Handling Machinery. Broadside showing different types of Jeffrey equipment used in various industries. THE JEFFREY MFG. CO., Columbus, Ohio.